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THE NEW ECONOMY

PROCEEDINGS

OF A

CONGRESSIONAL ECONOMIC CONFERENCE

ON

WEDNESDAY, JUNE 6, 1984

COSPONSORED BY THE

JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES

SUBCOMMITTEE ON GENERAL OVERSIGHT
AND THE ECONOMY

OF THE

COMMITTEE ON SMALL BUSINESS
HOUSE OF REPRESENTATIVES

AND THE

CONGRESSIONAL CLEARINGHOUSE ON THE FUTURE
CONGRESS OF THE UNITED STATES

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LETTER OF TRANSMITTAL

AUGUST 7, 1984.

To the Members of the Joint Economic Committee:

I am pleased to transmit the proceedings of the June 6, 1984, Conference entitled "The New Economy." The Conference was sponsored by the Joint Economic Committee, the Congressional Clearinghouse on the Future, and the Small Business Subcommittee on General Oversight and the Economy. Its purpose was to provide open and free dialog between recognized experts and Republican and Democratic Members of Congress on issues that affect the long-term growth and prosperity of the Nation.

A global perspective was maintained throughout the Conference. Domestic and international trends in output, productivity, technological change, and population were stressed in the morning session. The afternoon session addressed international patterns of industrialization, multinational business development, and innovation, with an eye to how those trends affect America.

The Conference drew upon recognized scholars, practitioners, and policy analysts in such diverse fields as economic modeling, demographics, international business, and innovation. Robert Premus, economist, Joint Economic Committee, Lena Lupica, director, Congressional Clearinghouse on the Future, and Charles McMillion, professional staff, Subcommittee on General Oversight and the Economy of the Small Business Committee, U.S. House of Representatives, are to be thanked for their efforts in organizing this Conference.

The views expressed herein are those of the authors and speakers, and do not necessarily represent the views of the Joint Economic Committee or its members.

Sincerely,

ROGER W. JEPSEN,
Chairman, Joint Economic Committee.

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THE NEW ECONOMY

WEDNESDAY, JUNE 6, 1984

Conference Agenda and Participants

Introductory Remarks of **HON. ROBERT EDGAR AND HON. JOHN HEINZ**

1:00 p.m.

Room B-352 Rayburn House Office Building

Held on the eve of the London Economic Summit, The New Economy conference explores issues that will be the heart of international summit meetings for years to come.

MACRO TRENDS

Introductory Remarks of **HON. BERKLEY BEDELL**

1:10-3:30 p.m.

Room B-352 Rayburn House Office Building

Speakers: **TED GORDON**, President, The Futures Group; **JAY FORRESTER**, Professor, MIT Sloan School of Management.

Reaction and Comment: **HON. JOHN HEINZ; HON. BOB EDGAR; HON BERKLEY BEDELL; HON. DANTE FASCELL; WARREN BROWN**, Senior Editor, Washington Post.

How will worldwide social, technological, political, and economic trends influence the U.S. economy in the future? This session considers international demographic shifts, technological developments, energy availability, and other trends as driving forces for global economic changes. Recent findings from the MIT computerized global model will be presented and the impact on key American economic concerns (i.e., government deficits, immigration, and technology transfer) will be discussed

INDUSTRY TRENDS

Introductory Remarks of **HON. DAN LUNGREN**

3:40-5:00 p.m.

Room B-352 Rayburn House Office Building

Speakers: **ORVILLE FREEMAN**, Chairman, Business International Corporation; **BILL SCHWEKE**, Program Director, Corporation for Enterprise Development.

Reaction and Comment: **HON. DAN LUNGREN; HON. CLAUDINE SCHNEIDER; HON. STAN LUNDINE; MONROE KARMIN**, Senior Editor, U.S. News & World Report.

How vital are international industrial shifts to the American economy? This session considers the U.S. ability to compete internationally, American entrepreneurism, and venture capital. Presented will be 1985–1995 forecasts for the international distribution of goods and services, key heavy industries, and high technology industries. Discussion items include implications for U.S. trade, jobs, research and development funding for American industries and defense, and appropriate public policy.

TRADE AND INVESTMENT POLICY

Introductory Remarks of **HON. WILLIAM ROTH**

6:00–9:00 p.m.

Room 2168 Rayburn House Office Building

Speaker: **ROBERT HORMATS**, Vice President for International Corporate Finance, Goldman, Sachs, and Company and past participant in four world Economic Summits.

How will the U.S. respond to the continuing strains on the world financial system? This session considers the interdependency of a world economy against a background of growing protectionism throughout the world. Discussions will revolve around major aspects of trade and finance: merchandise, services, high technology, East/West trade and LDC debts.

Dinner Discussion for Members of Congress and their guests

The conference convened at 1 p.m., in Room B-352, Rayburn House Office Building, Washington, DC, Hon. Robert Edgar (chairman of the Congressional Clearinghouse on the Future) presiding.

INTRODUCTORY REMARKS OF HON. BOB EDGAR, A U.S. REPRESENTATIVE IN CONGRESS FROM THE SEVENTH CONGRESSIONAL DISTRICT OF THE STATE OF PENNSYLVANIA, AND CHAIRMAN, CONGRESSIONAL CLEARINGHOUSE ON THE FUTURE

Representative EDGAR. I am Bob Edgar, chairman of the Congressional Clearinghouse on the Future.

I want to welcome all of you here today. The Congressional Clearinghouse on the Future is pleased to join with several other important groups, including the Joint Economic Committee, chaired by Senator Roger Jepsen, and the Small Business Subcommittee on General Oversight and the Economy, chaired by my colleague Berkley Bedell, in hosting the new economy conference.

The goal of this afternoon's program is to look at changes in the world which are creating an economic situation in the United

States and worldwide that is different from past generations. The changes include new technological developments, rapid population growth, limits to resources, concern over environmental pollution, potential for nuclear disaster and the overcapitalization of U.S. plants.

This new economy will require new responses from each of us as we produce legislation designed to move our nation toward an improved quality of life. However, as many of us know, the choices open to us are becoming more difficult. The world is much more complex and interdependent these days, and we must pay more attention to the global implications of our decisions. We have some tough choices to make about jobs in the future, about our immigration policy, about new technological developments, and about our trade and investment policy.

Our first two speakers, Ted Gordon and Jay Forrester, will present the macroeconomic perspective and will offer some guidance on the policy options open to legislators. Afterwards, three of my distinguished colleagues and the economics writer for The Washington Post and I will respond and ask some questions. We plan to have plenty of questions from the floor.

Following Jay Forrester and Ted Gordon will be Orville Freeman and Bill Schweke, who will concentrate on industrial trends.

Because of the bells, rather than moving immediately to the clearinghouse vice chairman, who is John Heinz, for his introductory remarks, John, I would hope you might yield to Berkley Bedell and Dante Fascell for their quick introductory remarks.

Senator HEINZ. By all means.

Representative EDGAR. We will then leave this session in charge of the Senator, and we will be back in a few minutes.

INTRODUCTORY REMARKS OF HON. BERKLEY BEDELL, A U.S. REPRESENTATIVE IN CONGRESS FROM THE SIXTH CONGRESSIONAL DISTRICT OF THE STATE OF IOWA, AND CHAIRMAN, SUBCOMMITTEE ON GENERAL OVERSIGHT AND THE ECONOMY, HOUSE COMMITTEE ON SMALL BUSINESS

Representative BEDELL. These are extraordinary times in the United States and, indeed, for the world economy. Technological innovations are racing ahead at an extraordinary pace. Will this lead us into an affluent and bountiful society? This certainly should be the case.

We now have as much knowledge and productive capacity to produce food and goods for our people as we have the overcapacity to exterminate all life on this planet. But there are numerous reasons to be concerned that a peaceful future may be very difficult to attain.

Even in the past year of economic recovery, the rapid reduction of unemployment in the United States was more than offset by increased unemployment in Europe and Canada. Much of the Third World now suffers unemployment and severe underemployment rates approaching 50 percent, with little sign of significant relief coming soon.

Indeed, there seems to be a growing feeling that in less developed countries (LDC), debt refinancing in recent years could soon be re-

placed by perhaps large-scale repudiations. Can this be avoided? If not, what will be the consequences for the United States and the world economy?

Government deficits are growing, not just in the United States but in many countries throughout the world. What happens if and when the world suffers its next business cycle downturn, which many business economists are predicting for late 1985 or 1986?

Populations are increasing rapidly in most of the world. How can our political institutions best respond to the potential opportunities and the very real dangers we face?

These are the questions we are here to wrestle with today, and we are very fortunate to have with us Mr. Ted Gordon and Mr. Jay Forrester to help us in this task.

Mr. Chairman, if I might have half a minute to introduce our panelists, then we can go vote. Is that all right?

Representative EDGAR. That is fine.

Representative BEDELL. Our first panel consists of Ted Gordon, president of the Futures Group, an international forecasting firm. Ted has done substantial work for many years in futures research and policy analysis. He is considered one of the leaders in developing forecasting methods.

In addition, as part of the choice of national priorities, he has studied such areas as U.S. power generating capabilities, new business strategies, and prospective scientific and technological developments.

Mr. Gordon is a consultant to many large corporations, lectures frequently, and holds several patents.

Joining him will be my good friend, Jay Forrester, director of systems dynamics programs at MIT's Sloan School of Management. Jay has written many books in the systems dynamics field, which have brought him national as well as international honors.

Mr. Forrester, I am told, is the inventor of random access memory technology, which is one of the innovations which makes computers so important in our society. I work with Jay a great deal. I know the work he has done with regard to using computers to help with some of our forecasting methods.

We are most fortunate to have Ted and Jay here for this first panel.

Representative EDGAR. We are going to move to the House floor. Let me yield to our colleague from the Senate, John Heinz. With that we will be disappearing.

INTRODUCTORY REMARKS OF HON. JOHN HEINZ, A U.S. SENATOR FROM THE STATE OF PENNSYLVANIA, AND VICE CHAIRMAN, CONGRESSIONAL CLEARINGHOUSE ON THE FUTURE

Senator HEINZ. Mr. Chairman, I thank you. This is a rare opportunity for the members of the other body to take charge of this side of the Capitol.

Representative FASCELL. Make the most of it, John. [Laughter.]

Senator HEINZ. We will do our best, Dante.

Ladies and gentlemen, I really want to draw your attention not to what Ted Gordon and Jay Forrester are about to say or even to our second panel, but to the opportunity you will all have this

evening between 6:00 and 9:00 o'clock to hear Bob Hormats discuss trade and investment policy.

I am a pitch man for Bob because you might get distracted by something between 5:00 and 6:00 o'clock. Were you to become distracted, you would fail to take advantage of the opportunity to hear Bob's perceptions about the increasing interdependence of the world economy against a background of growing protectionisn.

I can tell you, as someone who just came from chairing a subcommittee hearing on international debt, the strength of the dollar and the deindustrialization of the United States, that there are a number of questions of immediate relevance and, also, as a sometime journeyman congressional practitioner in the trade area, that there are some profound changes taking place in international trade.

One thinks of technological changes just in, for example, the way transportation and communications are making the world smaller, but what that really means to my rose growers in Pennsylvania is that over half of all the cut flowers daily no longer come from the United States. They come from faraway places like Colombia and Israel.

Since we are not alone in slowing down our market, particularly since it is so free and open, we have all become much more conscious of barriers to trade and the need for international rules to straighten those out.

And one final "for instance." There are so many new entrants into the world trading system, particularly the LDC's, who have standards and practices so much at variance with ours. The system drawn up at Bretton Woods and thereafter by ourselves and our European allies challenges us. My steelmakers and workers can attest to that.

If you think it is tough adjusting to what developed countries like the European Community have given to us in the form of subsidized exports, it is even tougher to adjust to the lack of assumed responsibility on the part of the less developed countries. They should be assuming a little responsibility along with their development.

All of which is to say that this is just scratching the surface. Bob Hormats is really well-qualified to address these changes in world trade. He has been involved in world trade and international economics for over 10 years. He served as Ambassador and Deputy Trade Representative during the course of two administrations. He now serves as vice president for international corporate planning at Goldman, Sachs & Co.

He has been a participant at four world economic summit conferences, and he could not be a better speaker for us to have on the eve of the London Economic Summit.

So I hope, after you have learned everything you can from Jay Forrester and Ted Gordon, Orville Freeman and Bill Schweke, that you will strengthen yourselves and come back this evening for a piece de resistance, which means the last thing.

I guess the order has been determined. I assume, Ted, since your name comes first on the program, that you are to go first, and in the absence of any Members of the House to contradict me, a rare opportunity, let me recognize Ted Gordon.

REMARKS OF TED GORDON, PRESIDENT, THE FUTURES GROUP

Mr. GORDON. Mr. Vice Chairman, absent members of the committee, and ladies and gentlemen, good afternoon. It is a pleasure to be with you.

As billed, the topic for the next 30 minutes or so of my talk is global trends, with particular emphasis on international demographics, which drive shifts in the economics on a global scale. In this exploration, I intend to talk about people, food, and work and how technology influences all three.

I have resisted the temptation to extend the discussion into economics per se or trade or debt in the interest of time and because other speakers are scheduled to speak on those topics as well.

Nevertheless, this agenda of people, food, and work is quite a bite to compress into 30 minutes, but I will try to do that.

I am also going to note as we go through this material what I consider important policy areas for the United States to consider, and I will certainly be happy to handle questions from you all at the end of this first session. But if I were to say anything in the next 30 minutes that excites a question in your mind, ask it as it occurs to you, and I will be glad to handle it if I can.

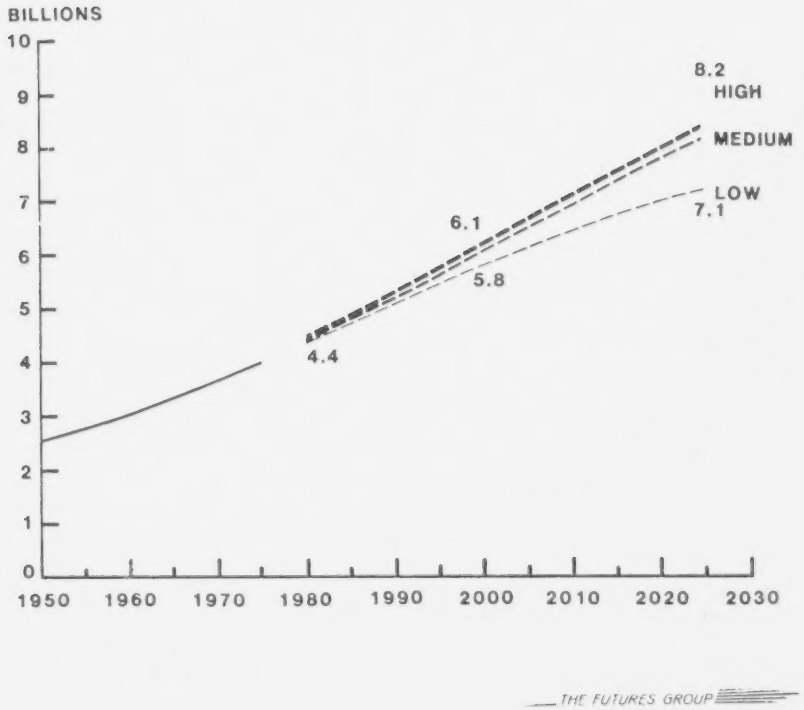
I am going to use the projector here.

To begin with, people.

[Slide 1.]

Slide 1

WORLD POPULATION



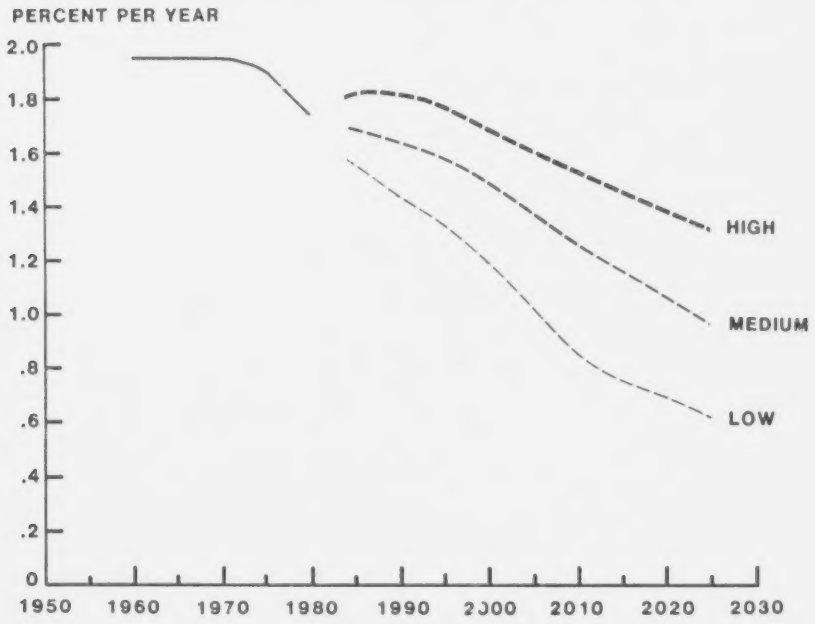
Some of the material that I am going to give you is fact. Other material is judgment, conjecture. I will try to distinguish between fact and conjecture as we go through this material.

This is a chart which takes us from 1950 through the year 2030, showing real population growth on the left up through today's world population level of about 4.4 billion, give or take a few hundred million—total world, not just developing world—with three projections for population growth—low, medium, and high projection—by the turn of the century taking us to somewhere between 5.8 billion and 6.1 billion, a pretty good target. Things would have to change very radically for us in the world for those numbers to be far wrong. There is much more conjectural after the year 2030—that is 50 years—with population levels forecasted on the order of 7 to 8 billion.

[Slide 2.]

Slide 2

WORLD POPULATION GROWTH RATE



If you notice those curves, they are S-shaped over in this area, bending upward, and right about now beginning to turn over. That is because growth rates in the world have begun to fall.

This is world population growth rate in terms of compounding rate, percent per year. The highest compounding rate was reached recently in the late 1960's and early 1970's, about 2 percent per year compounding, and those rates have now begun to drop, as you see here.

That is the assumption on which that low projection is based, the medium projection and high projection. Population growth rates are dropping primarily because of technology; that is, contraceptives--simple, cheap, effective contraceptives--and because of the perception on the part of most governments of the world that lower populations work to the political, economic, and social advantage of people in those countries.

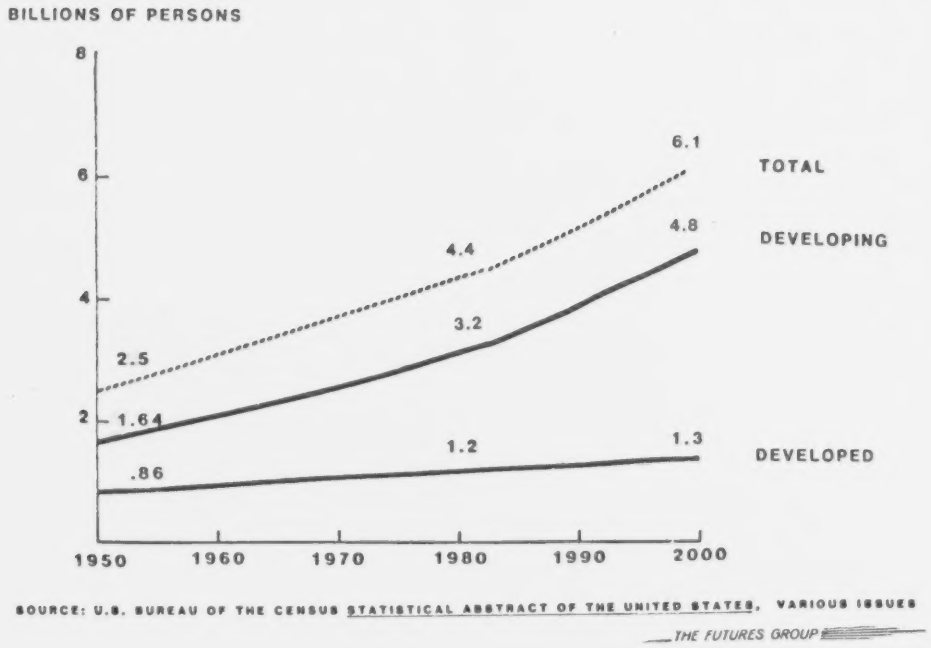
The overhead of a young population, requiring jobs as they mature, is lessened when population pressures are reduced. So on the one hand, the means for reducing those population pressures is contraceptives. On the other hand, new attitudes on the parts of

government, and people, and feminism have created conditions in which those technologies are used more frequently now.

[Slide 3.]

Slide 3

WORLD POPULATION



SOURCE: U.S. BUREAU OF THE CENSUS STATISTICAL ABSTRACT OF THE UNITED STATES, VARIOUS ISSUES

THE FUTURES GROUP

It is important to note that while we have looked at the world as a whole there is a great difference between developing and developed countries in population. The growth of population in developed countries is much slower than the growth of population in developing countries.

I use the definition of "developing countries" here very narrowly, as $1,000 per year per person GDP divided by the number of people being less than 1,000.

Even within the poorer countries there is a great disparity in birth rate. This is compounding rate in several different areas of the world—Africa, Latin America, South Asia, and Europe—showing birth rates falling very fast. That axis is zero. This is the annual population growth rate—not birth rate, growth rate—falling to almost zero. South Asia already bending over, Latin America already bending over, but Africa still ascending and reaching a peak. It will be good if that peak is reached—for reasons I will show you in a moment—before the year 2000.

[Slide 4.]

Slide 4

PERCENT INCREASE IN POPULATION 1980-2000 BY REGION
UN MEDIAN VARIANT

PERCENT INCREASE	SUB-SAHARAN AFRICA	ASIA	NORTHERN AFRICA AND MIDDLE EAST	LATIN AMERICA
100-115	KENYA			
85-100	MALAWI NIGERIA TANZANIA UGANDA		JORDAN SAUDI ARABIA ALGERIA IRAQ SYRIA	HONDURAS MEXICO
70-85	GHANA MOZAMBIQUE IVORY CST NIGER LIBERIA SENEGAL MADAGASCAR UPPER MALI VOLTA	PAKISTAN BANGLADESH	MOROCCO IRAN	ECUADOR EL SALVADOR GUATEMALA PARAGUAY VENEZUELA
55-70	ANGOLA ETHIOPIA ZAIRE	AFGHANISTAN BURMA NEPAL PHILIPPINES THAILAND	ARAB REPUBLIC OF YEMEN SUDAN	BOLIVIA HAITI BRAZIL PERU COLOMBIA DOMINICAN REPUBLIC
40-55	CAMEROON	CAMBODIA VIETNAM INDIA INDONESIA MALAYSIA	EGYPT TUNISIA TURKEY	COSTA RICA PANAMA
25-40		SRI LANKA REPUBLIC OF KOREA		CHILE CUBA
10-25		CHINA		ARGENTINA

—THE FUTURES GROUP

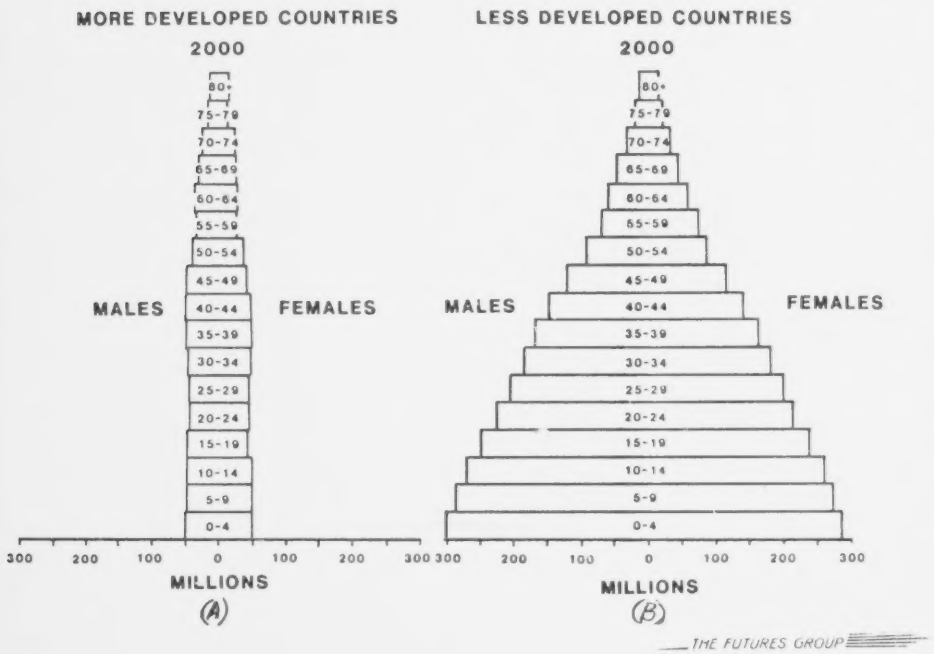
Even within the developing countries, there is a great disparity by country. This shows the percent increase in population between 1980 and the year 2000, just comparing the 1980 population to the year 2000 population. This is a 100 percent growth—that is a doubling of the population—all the way down to 10 to 25 percent growth.

In the poorer countries, you see China down here, well controlled in their population, Argentina down here, Sri Lanka, the Republic of Korea, Chile, Cuba, and up at the top Kenya, Nigeria, Tanzania, Uganda, and so on—Africa and some North African/Middle East appearing here at the high end.

[Slide 5.]

Slide 5

AGE STRUCTURE OF MORE DEVELOPED AND LESS DEVELOPED COUNTRIES IN 2000



This is really an astounding chart. It is familiar to demographers, which shows numbers of people of a given age stacked one on top of the other, all the way up from the age of zero to 4 through age 80.

Chart 5A is the developed world, all countries of the world that have more than $1,000 per year per person income.

Chart 5B is the less developed world, all countries of the world that have less than $1,000 per year per person income.

Now, usually when you see this chart it is in percentage terms. This is not in percentage terms. If you add up all of the people represented in those bars, you get 6 billion.

In a developed country that has control over its birth rate, very low population growth rates, you see this becomes rectangular. The 4-year-olds become 5-year-olds one year later, the 9-year-olds become 10-year-olds, and as the world ages they move box to box.

But look at the problem here in the developing countries. There's the 4-year-olds. they will inevitably become 5 years old, and that bar will go out a notch 5 years later, and it moves up. As more are born, that lower bar gets bigger.

Half the world is below the 15-year bar by the year 2000. So we expect by the year 2000 that about 80 percent of the people in the world will be in poor countries, and most of them will be very young.

And in the richer countries; that is, the developed countries, about 20 percent of the people in the world will be 40 to 45. The median age will be about 37. I am not absolutely sure of that, but it is in there, approximately.

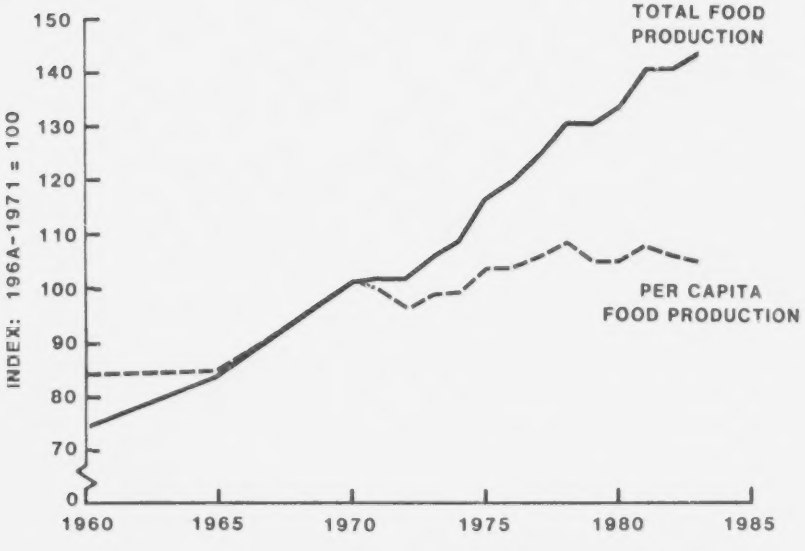
If that is likely—and I believe that it is—the next question to address is: will there be food for all of these people?

The answer to that in a nutshell is we think so, but with some scary points there.

[Slide 6.]

Slide 6

TOTAL AND PER CAPITA FOOD PRODUCTION: DEVELOPING COUNTRIES



SOURCE: USDA, WORLD ANALYSIS BRANCH.

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This is a chart of recent history of total food production in poorer countries; that is, total food production in terms of calories based on an index which gave us 100 in 1970.

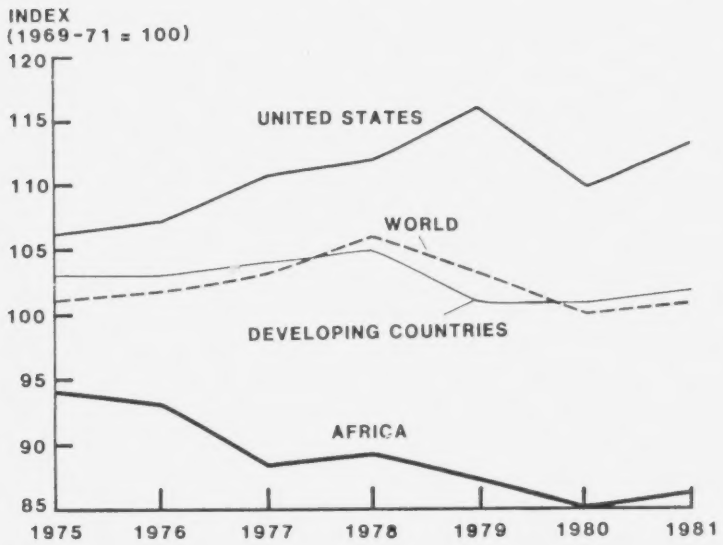
And food per capita—that is this dotted line, hovering at an index of about 100. That means that as the number of people in the developing world increases, the amount of food increases at about the same rate. Population growth rate is 1.8 percent per year, and then food production growth rate is 1.8 percent per year, and we stay status quo.

Looked at in these terms, it has been a fairly impressive performance. The poorer countries have managed to increase their food production at about the same rate as population.

[Slide 7.]

Slide 7

PER CAPITA FOOD PRODUCTION



SOURCE: WORLD FOOD AID NEEDS AND AVAILABILITIES, 1981.
U.S. DEPARTMENT OF AGRICULTURE, 1981.

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But a little examination under the surface shows some problems. Here is the same chart, roughly, showing the world as a whole. The developing countries, the United States and Africa are superimposed. Africa is going down, and therefore in some trouble.

[Slide 8.]

Slide 8

CALORIC SUPPLY AS A PERCENTAGE OF REQUIREMENTS IN LATIN AMERICA

SUPPLY AS A PERCENTAGE OF REQUIREMENTS	1972-1974	2000 MEDIUM VARIANT*
120+	ARGENTINA	ARGENTINA BRAZIL BOLIVIA COLOMBIA CUBA GUATEMALA VENEZUELA
100-120	BRAZIL CUBA VENEZUELA MEXICO	DOMINICAN REPUBLIC EL SALVADOR
80-100	COLOMBIA DOMINICAN REPUBLIC ECUADOR EL SALVADOR GUATEMALA HAITI HONDURAS PERU	PERU MEXICO
LESS THAN 80	BOLIVIA EL SALVADOR	ECUADOR HAITI HONDURAS

*Assuming continuation of food production growth rates from 1970 to 1986.

SOURCE OF HISTORICAL DATA: Food and Agricultural Organization, The Fourth World Food Survey (FAO, Rome 1977).

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Again, one can break this down by country. This chart shows, for the years 1972 to 1974—just an anchoring point in history—and for the year 2000 the projection, the supply of food, including imports, as a percentage of the requirements of those countries.

In Latin America, in the 120 area, which is what most people think. That means 120 percent of the requirements are there as supply. More than you need is there. Most people in this field feel that that kind of surplus is required because of maldistribution of food in order for most of the population to have adequate food.

What is happening here in Latin America, using some extrapolative forecasts about the introduction of technology into agriculture, is that a lot of countries that were not in this domain before this 120 percent move up. That is very happy, obviously, but there are still some countries down here in the lowest bar. Less than 80 percent of what they need is likely to be available.

[Slide 9.]

Slide 9

CALORIC SUPPLY AS A PERCENTAGE OF REQUIREMENTS IN ASIA

SUPPLY AS A PERCENTAGE OF REQUIREMENTS	1972-1974	2000 MEDIUM VARIANT*
120+		CHINA INDONESIA REPUBLIC OF KOREA MALAYSIA PHILIPPINES THAILAND
100-200	CHINA REPUBLIC OF KOREA MALAYSIA THAILAND VIETNAM	AFGHANISTAN
80-100	AFGHANISTAN BURMA INDONESIA KAMPUCHEA NEPAL PHILIPPINES PAKISTAN	BURMA INDIA KAMPUCHEA VIETNAM
LESS THAN 80	BANGLADESH	BANGLADESH NEPAL PAKISTAN

*Assuming continuation of food production growth rates from 1970 to 1976.

SOURCE OF HISTORICAL DATA: Food and Agricultural Organization, The Fourth World Survey (FAO, Rome 1977).

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In Asia the same kind of situation occurs. It looks like technology of agriculture moves a lot of countries up in this direction, which is happy.

Bangladesh and Nepal and Pakistan occupy the lower area.

[Slide 10.]

Slide 10

CALORIC SUPPLY AS A PERCENTAGE OF REQUIREMENTS IN AFRICA

SUPPLY AS A PERCENTAGE OF REQUIREMENTS	1972-1974	2000 MEDIAN VARIANT*
120+		CAMEROON IVORY COAST SUDAN TANZANIA TUNISIA ZAMBIA
100-200	IVORY COAST MADAGASCAR MALAWI MOROCCO	
80-100	ALGERIA, ANGOLA, CAMEROON, ETHIOPIA, GHANA, KENYA, MOZAMBIQUE, NIGER, NIGERIA, SUDAN, TANZANIA, TUNISIA, UGANDA, ZAIRE, ZAMBIA	MADAGASCAR MALAWI
LESS THAN 80	MALI UPPER VOLTA	ALGERIA, ANGOLA, ETHIOPIA, GHANA, KENYA, MALI, MOROCCO, MOZAMBIQUE, NIGER, NIGERIA, UGANDA, UPPER VOLTA, ZAIRE

*Assuming continuation of food production growth rates from 1970 to 1976.

SOURCE OF HISTORICAL DATA: Food and Agricultural Organization, The Fourth World Food Survey (FAO, Rome 1977).

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But in Africa, again the problem is of a different sort. You see the lower box gets very highly populated, indicating that the population pressures do not permit the agricultural developments to keep pace. Therefore, those countries face a problem of obtaining food for their people.

[Slide 11.]

Slide 11

THREE STRATEGIES

- IMPROVING PRODUCTIVITY
  - NITROGEN FIXATION
  - IMPROVED IRRIGATION
  - MULTIPLE CROPPING
- INCREASING ACREAGE
  - IRRIGATION OF MARGINAL LANDS
  - OCEAN USES
  - FOOD FACTORIES
- NEW FOODS
  - UNUSAL FORMS OF MARINE LIFE
  - INSECTS AND RODENTS
  - FLAVORS/FRAGRANCES AND TEXTURES

The technology of agriculture is impressive, and we expect to see really important changes come about here. There are three general strategies for increasing the output of agriculture.

One is improving productivity, more calories per acre. I note on this chart some of the specific techniques that are in development or are likely to be available in the short term for improving the output per acre of a farm: multiple cropping, reduced tillage, low energy techniques, and inhibition of the respiration of leaves. What that means is that the plant in the process of growing brings in moisture from the soil. That moisture is evaporated inevitably through the leaves, and after harvest the plant has to be dried. You have to put energy in.

So from a systems standpoint, here we are putting water into the plants through irrigation, they get rid of it, and you have to dry them anyhow after you harvest them. Something is inefficient.

So some scientists are working on the possibility of reducing this evaporative cycle so that the plant itself becomes less moisture laden and less respirationed, in a biological sense.

If necessary, biological nitrogen fixation, increasing the potential for self-fertilization in plants through genetic techniques, and genetic improvements in general, improving the nutritional quality of plants as well as their productivity.

A second strategy is increasing the amount of acres available through bringing marginal lands into cultivation, grazing animals as opposed to feed lot animals. Animals in feed lots take 7 grams of protein in for every gram of protein out. So there is an inefficiency in the use of grain for feed lots However, if the animals graze, they bring grasses into cultivation; they bring grasses into the human food cycle which were not previously available and in the form of high grade protein.

Ocean uses, food factories and even the possibility of new foods are possible. We don't eat everything that is edible by far.

I don't really mean to recommend new forms of marine life, what we used to call trash fish. All we have to do is rename them and they become delicacies. [Laughter.]

Single-cell protein, insects and rodents. I don't know how that can be made palatable, not for us, but as a source of protein perhaps in some form.

Protein synthesis, flavors, fragrances, and textures can be used to convert protein from one form to another to meet the requirements in terms of food.

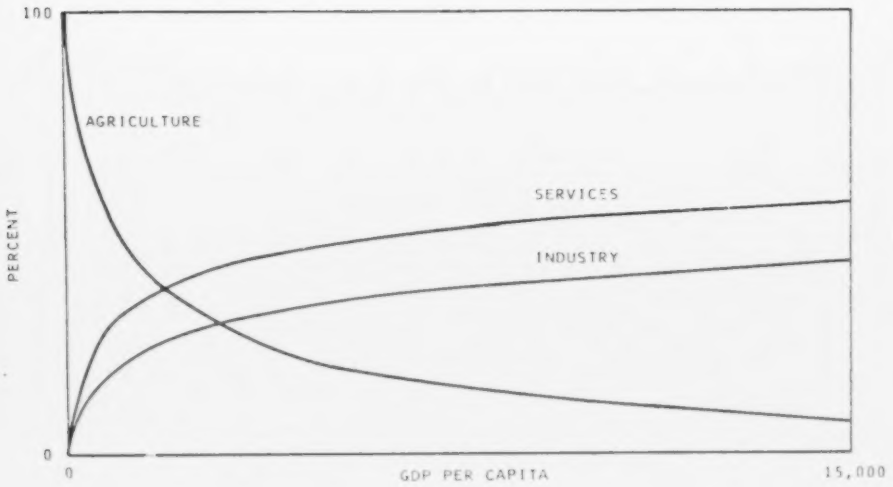
So the picture for food—given that image of population growth, the slowing of growth, the disparities in growth rate between countries is that for most people in the world it appears that technology can keep pace.

There are some places in the world where it will be difficult for technology to keep agricultural output even with population, and those countries are ones that have difficulty in storing food.

[Slide 12.]

Slide 12

DISTRIBUTION OF LABOR FORCE VS. GDP PER CAPITA



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Let's look at this question of labor or work. We built a small model at The Futures Group which I am going to use as the basis for this discussion. It used to be in the early 1950's that the attitude among people who studied this topic was that poverty and unemployment can be overcome by increasing productivity—that means economic productivity—and improving economic growth.

In the mid-1960's the question began to be asked: Will the fruits of development within a country trickle down to its poorest people? The attitudes now in the early 1980's seem to be a shift from this economic growth to a focus on employment-based strategies: that is, let us follow policies that have intrinsic within them employment rather than employment as a secondary consequence.

I might just say at the outset before I show you these data that when we talk about unemployment, when we deal with it on a worldwide basis, the statistics here are very, very sketchy, and since people who are out of work and discouraged about finding work are no longer counted as unemployed, you have to take all of the statistics here with a grain of salt.

Furthermore, there is the problem in the world as a whole of underemployment, not just a matter of unemployment, not having any job at all, but working at jobs that are really not productive or meaningful to the people who have that work or to the economies in which that work takes place.

In this model we looked at the 124 countries in the period 1970 to 1980, measured development by GDP per capita. There are a lot of people who would challenge that definition, but we say development occurs when GDP per capita grows.

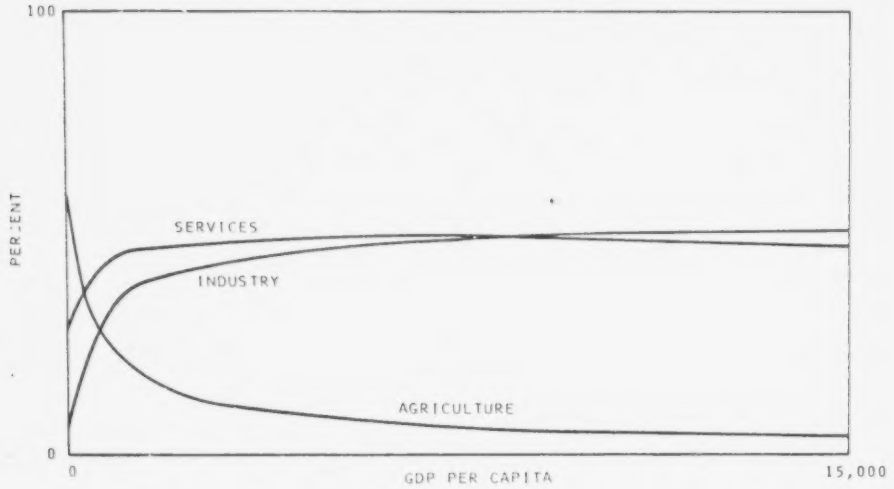
We found that we could really define—by looking at this set of countries in a statistically valid way—a number of parameters that permitted us to make a forecast. We are talking about percentage of the labor force in three sectors—agriculture, services, and industry. As development occurs—that is, GDP per capita grows—we found that we could look at these countries and really organize them in terms of the percentage of people within the labor force that were in those sectors.

As a country becomes richer, a smaller percentage of its labor force is in agriculture. That is not news. I am simply telling you that the statistics validate that idea. And, ditto, as the country develops the percentage of the labor force in services and the percentage of the labor force in industry grows.

[Slide 13.]

Slide 13

DISTRIBUTION OF GDP VS. GDP PER CAPITA



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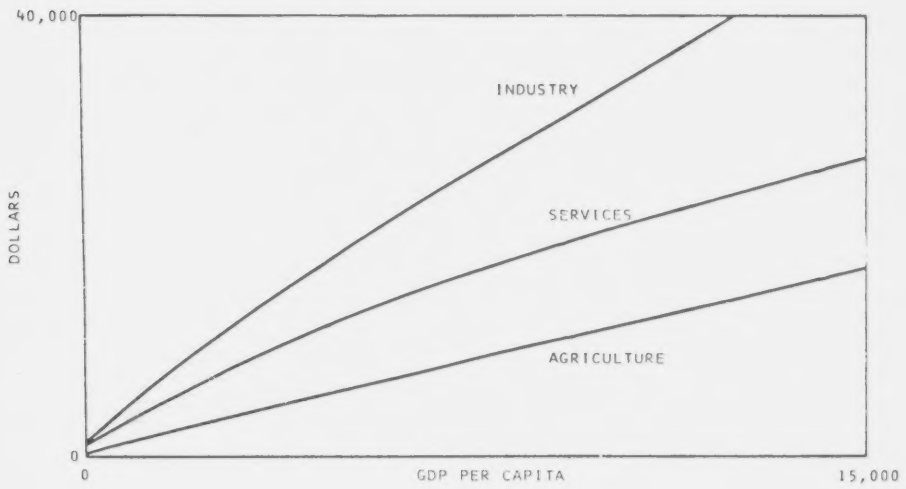
When we look at the GDP, the percentage of the countries' gross product in those areas, we see a similar trend. As the development occurs, agriculture becomes less important to the economy.

[Slide 14.]

Slide 14

PRODUCTIVITY PER LABOR FORCE PARTICIPANT VS. GDP PER CAPITA



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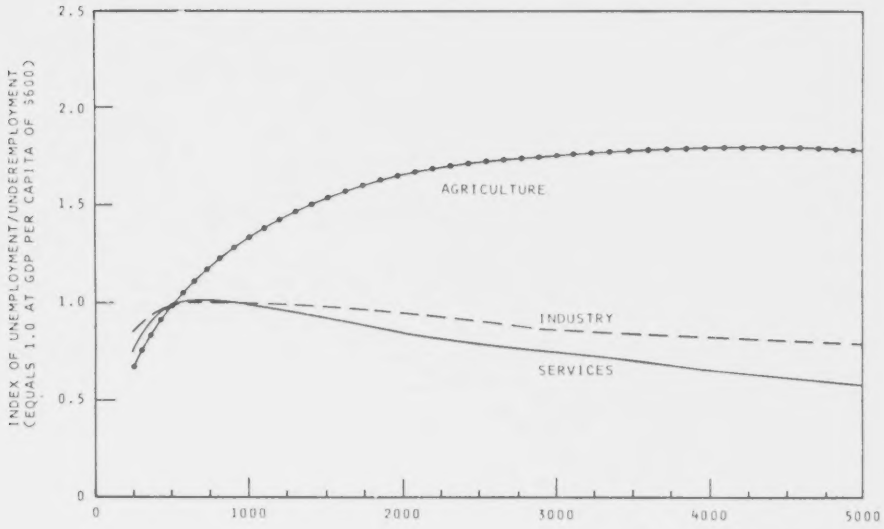
And as we look at productivity—that means output per man-hour, a difficult measure at best—we find that as the economy grows so does the output grow in the sectors shown.

Given all of that as a starting point, all of that statistical base, we then built a model which allows us to evaluate the potential for unemployment.

[Slide 15.]

Slide 15

RELATIVE UNEMPLOYMENT/UNDEREMPLOYMENT BY SECTOR VS. GDP PER CAPITA



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This is an unemployment index. As we move up on that scale, unemployment increases. A value of 1 means that the labor force that is available is identical to the labor force that is required. They just match. No unemployment.

This shows then, using these countries as our base, that as development increases, unemployment in agriculture grows and underemployment in the industrial sector and the services sector occurs.

However, there is more unemployment in agriculture than there is demand for people in the other sectors. There's too many farmers, and the potential for those farmers to be used in other sectors of the economy seems dim.

To give you a few numbers that occur here, as expected, when economic growth grew, GDP per capita grew. When economic growth dropped, GDP per capita dropped, comparing today with the year 2000. But unemployment in these countries seemed remarkably insensitive to economic growth.

If we assumed an economic growth of 6½ percent for the developing countries, unemployment reached about 600 million by the turn of the century. If we assumed 4 percent economic growth, it reached 559 million. Very insensitive, but the model is very, very sensitive to our assumptions about productivity, how much productivity.

This led us to form a set of policy recommendations, which I will offer to you.

[Slide 16.]

Slide 16

SUMMARY OF RESULTS

- PRODUCTIVITY-RELATED TECHNOLOGY: CURRENT TRENDS LEAD TO INCREASING UNEMPLOYMENT IN AGRICULTURAL SECTOR
- POPULATION GROWTH RATES: STILL A PROBLEM IN MANY COUNTRIES
- ECONOMIC GROWTH TARGETS AND POLICIES SHOULD CONSIDER EMPLOYMENT EFFECTS MORE EXPLICITLY
- INCREASED EMPLOYMENT GENERATION IS NEEDED TO REDUCE POVERTY CAUSED BY UNDEREMPLOYMENT
- NEW AGRICULTURAL POLICIES: MAXIMIZE AGRICULTURAL EMPLOYMENT
  - FROM STANDPOINT OF FOOD PRODUCTION
  - AS A SOLUTION TO UNEMPLOYMENT

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Productivity-related technology, current trends lead to increasing unemployment in the agricultural sector for the poorer countries. See the bind they are caught in. They need the productivity to get the food, but many of the techniques for increasing productivity rob them of jobs. So it is a very sensitive, delicate balance that is faced here in determining how to improve agricultural output.

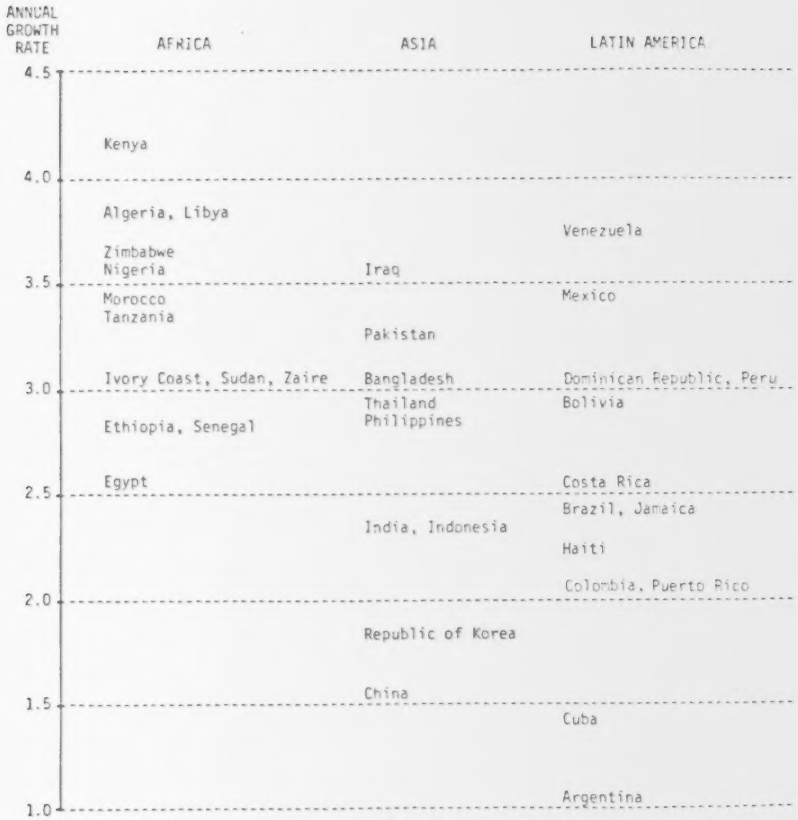
Population growth is still a problem in many countries. Economic growth targets and policies we believe should consider employment effects. Specifically, increased employment generation is needed to reduce poverty caused by underemployment and new agricultural policies, maximize agricultural employment from the standpoint of food production, and as a solution to unemployment.

Unemployment in those countries means political instability, urban overcrowding, because those unemployed farmers move to the cities.

[Slide 17.]

Slide 17

LABOR FORCE GROWTH 1980-2000



SOURCE: GLOBESCAN II (The Futures Group, Glastonbury, Connecticut, 1982).

And, as in the case of food, this is not homogeneous by any means, some countries have a worse problem than others. I have summarized on this chart those countries that have high labor force growth rates in Africa, Asia, and Latin America. Again you see the same players that we saw a moment ago when we talked about agriculture on the upper left.

Again using this fabric, these threads, I now want to make a tapestry by giving you a weave in the other direction. I am now going to talk about technologies that may affect people, numbers of people, that may affect food and that may affect productivity.

[Slide 18.]

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Slide 18

KEY TECHNOLOGIES

- BIOMEDICINE
- ELECTRONICS AND ITS DERIVITIVES
- MATERIALS
- GENETICS

In terms of technologies that may affect a number of people, biomedical technologies abound. This is a period of time when biomedical technologies will come on the scene and affect not only survival in the young years in these developing countries, but now for the first time improved longevity at middle age and early old age.

[Slide 19.]

Slide 19

EXAMPLES OF BIOMEDICAL TECHNOLOGIES

DIAGNOSTICS:

- **PORTABLE CONTINUOUS AMBULATORY MONITORS**
- **BRAIN ELECTRICAL ACTIVITY MAPPING**
- **COMPUTERIZED AXIAL TOMOGRAPHY (CAT)**
- **POSITRON EMISSION TRANSVERSE TOMOGRAPHY (PETT)**
- **GENETIC ASSAY**

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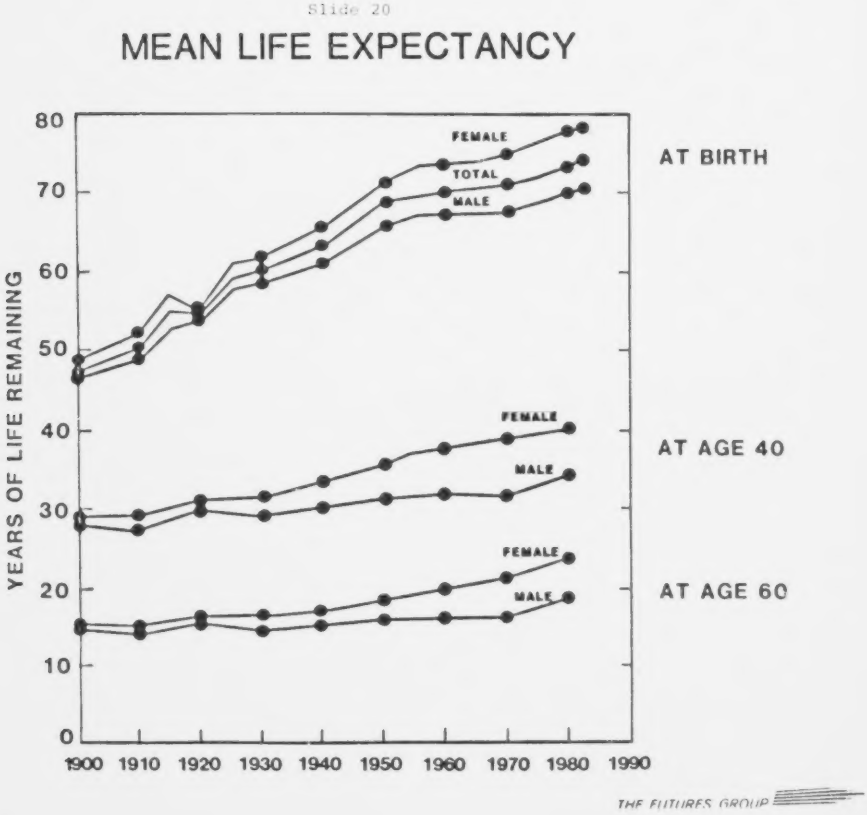
I am happy to report to you that we will all live longer than the actuarial statistics suggest we will live. That is a pretty good bet, and it is because the diseases that kill people at middle age and early old age—namely, cancer, heart disease, and stroke—are being cured at a rate that is not anticipated by the actuarial statistics.

[Slide 20.]

Slide 20



What this means is as follows: If we take a survival curve that tracks 100,000 people—insurance rates and social security and annuities are computed on certain statistics that anticipate survival of a given number of people as they age—here is the assumption: By the time you get to 100,000—here's 100,000 people born. By the time they get to be 100 nobody is left.

[Slide 21.]

Slide 21

EXAMPLES OF BIOMEDICAL TECHNOLOGIES

THERAPIES:

- **IMPLANTABLE PACEMAKERS (HEART DISEASE)**
- **MICROVASCULAR SURGERY (STROKE)**
- **CORONARY ARTERY BYPASS SURGERY**
- **MONOCLONAL ANTIBODIES (CANCER)**
- **INTERFERON (CANCER)**

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Now, as these diseases that kill in middle age and early old age are reduced in their mortality significance—already happening for heart disease, very likely to happen in the case of cancer—that curve tends to become rectangular, and in the limit, if that curve ever became rectangular—it won't, but if it were to—then you would live to your hundredth birthday and die on the next day. That is reducing it to absurdity, but it establishes what that means.

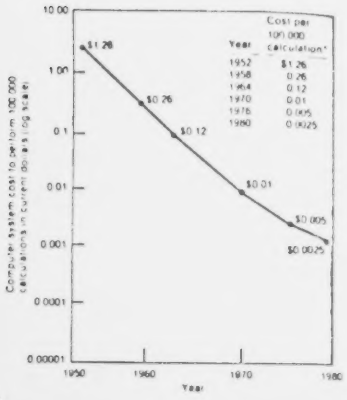
I'm not just telling you that there are going to be more older people. I'm telling you that there are going to be many, many more older people than we guessed at. It is our belief that those mortality statistics are changing very rapidly and, therefore, survival in old age is something that is part of these 20 years that we are exploring. These technologies inevitably move to the developing countries to give additional pressure on population growth.

The second technology I want to recognize is electronics.

[Slide 22.]

Slide 22

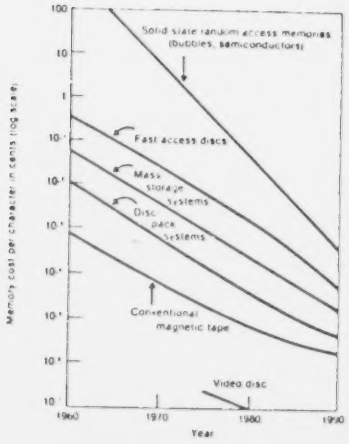
DROP IN AVERAGE COMPUTER SYETEM COST PER 100,000 CALCULATIONS FROM 1952 TO 1980



* COST PER 100,000 CALCULATION IS BASED ON DATA FOR THE FOLLOWING IBM COMPUTER SYSTEMS (WITH YEAR IN PARENTHESES): 701 (1952), 7090 (1958), 360/50 (1964), 370/158 (1970), 3033 (1978), 4300 (1980).

SOURCE: OFFICE OF TECHNOLOGY ASSESSMENT AND PRESIDENT'S REORGANIZATION PROJECT, FEDERAL DATA PROCESSING REORGANIZATION STUDY: BASIC REPORT OF THE SCIENCE AND TECHNOLOGY TEAM, WASHINGTON, DC., JUNE 1978, PP. 29-30.

PROJECTIONS FOR MEMORY COST PER CHARACTER



SOURCE: OFFICE OF TECHNOLOGY ASSESSMENT AND PRIVACY PROTECTION STUDY COMMISSION

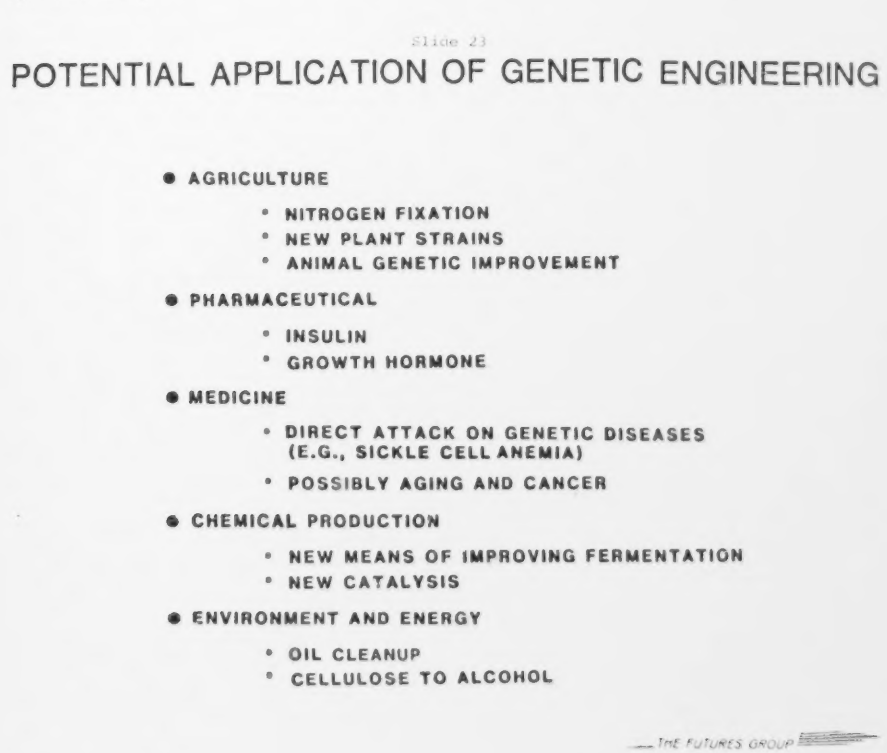
In the case of electronics we have three trends going on simultaneously. Volumetric compression—there are more things packed into a smaller volume—reduced costs for a given function; and improved reliability.

All of these trends are progressing at two orders of magnitude or so per decade. As we look at barriers to progress in those three trends—certainly there are barriers there—just on the other side of most of those barriers there is a solution to them. You can't pack things more closely together than the wavelength of light will permit unless you use, in photolithography, some energy source that has a shorter wavelength—electron beam imaging, for example.

So the basic technology moves ahead at its present pace, or slightly off that pace, for the next 10 to 15 years, maybe longer, as long as there is a market to draw it out. The consequences for the subject we are dealing with here are improved automation. Everything you've read is correct and potentially conservative. For the Third World countries, it means potentially labor replacements to improve economic development but again at the cost of jobs. It means the potential for leapfrogging development, as we know it, into other forms of development that we can only guess at.

The last technology I want to mention is genetic engineering.

[Slide 23.]



A technology of profound consequence to all of the people in the world. I have illustrated here some potential applications of genetic engineering in agriculture, pharmaceuticals, medicine, chemical production, and the environment. Most important for this discussion is the use of genetic engineering in agricultural applications, which have not yet been made to any depth but which should really be expected in this time period: for improving productivity, as I mentioned before; for developing new plant strains, and improving the genetic characteristics of animals. In fact, by the end of this 20 year time period, it would not be inconceivable to imagine our designing plants and animals to meet certain human needs. Of course, application to pharmaceuticals and medical and chemical production are all important to the emerging world economics scene.

Mr. BROWN. Mr. Gordon, how are these older, currently rich countries, nearly all of whom have tremendous deficits now, going to support themselves without a youth base and industry?

Mr. GORDON. Currently rich countries?

Mr. BROWN. All of whom have deficits now? How do they support themselves without a youth base to, say, support basic industry? Can you foresee them getting along without it?

Mr. GORDON. I don't understand your question. Why is a youth base necessary for economic development?

Mr. BROWN. I would imagine presumably, not to put down anyone who is over 70 or 75, but rather doubt that you are going to have people 75, 76 years old traipsing off to somebody's factory, assuming they still have factories, right, to support a basic industrial base. I would imagine that you would probably need a younger work force.

Are you perhaps suggesting that somehow youth and everything it has to offer to a basic industrial operation is obsolete?

Mr. GORDON. Far be it from me to suggest that youth is obsolete, but you see this shape of the labor force really does change. We are in the midst today, in the United States, of the first evidence of that change, since the number of people born in 1960 was a peak in the United States—4 million or so—and that was 24 years ago.

The number of people who reached 24 years of age from this point on continue to diminish, so we are already experiencing in the United States a reduction of pressures of entry into the labor force of young people. It's already going down. We expect it to go down until the echo boom starts entering.

Now, is that good or bad for the labor force? It is a peculiar coincidence that that is happening in our country at exactly the time that longevity is increasing. Our judgment is that people will work longer, maybe not in an official job, but work longer and be productive for longer periods of time. It's a remarkable coincidence that's happening. This vitality of the elderly is occurring at exactly the time that entry pressures into the labor force are diminishing because of demographic cycles.

Mr. BROWN. Let me see if I can put it this way. Assuming that you are going to have basic industries, right, even in the older richer countries, and even assuming that, as you say, you are going to have people working longer because the longevity has increased,

are you still going to have the need for a youthful work force? To the extent that you do, where are those people going to come from?

Mr. GORDON. There are two answers. Sure you are going to need young people in the labor force, but because they are going to do the menial jobs, not because they are stronger in any sense. In a rich country the menial jobs, the tedious, the dangerous, the disease provoking jobs, will largely be automated within 30 years through robotics, at least many of those that can support that kind of transition.

But we do need younger people for young ideas, for vitality, for bringing new directions and new values into society as a whole, not just the labor force The ability for people to work, and work at meaningful jobs, has not changed, I believe, by anything I've said. In fact, probably improved.

Older people without this kind of transition in richer countries, putting aside the poorer countries which are, of course, very different, but in richer countries, in years past, older people had a long period of time of unproductive life to look forward to. I think that changes and now the period of time between finishing the basic career and death is extended. The meaningfulness of that time, because there are occupations available and needed, has improved.

In the poorer countries the problem is very, very much different. The problem there is jobs. Just pure job count. Where are those people going to work, and how are they going to work, and what are they going to work at? And without those jobs, the chances for political turmoil are very great.

Senator HEINZ. Mr. Gordon, just following up on that, would you not agree that what we are likely to see concomitant with this squaring or rectanguliniation of the developed countries' population structure is that instead of medical science, in addition to medical science pushing out the frontiers of longevity, that instead of worrying almost exclusively about AIDS and herpes, we will begin to do some research on things like Alzheimer's disease, rheumatoid arthritis, and the diseases that impair the quality of life.

Mr. GORDON. Absolutely, Senator. I agree completely. Certainly diseases of the sort you mentioned are age linked. That's why you mentioned them obviously.

It's relatively easy to forecast the number of people who have a given disease of that sort. As the curve gets squared, Alzheimer's disease, in particular, is one that evokes a great deal, necessarily evokes a great deal of social dependency. So, it's not all favorable when you talk about that curve squaring. The number of people who have that disease and their dependency on social institutions for support grows enormously. Therefore research in those areas is really required.

Mr. FREEMAN. Ted, in the whole question of jobs and job creation, how do you explain the extraordinary record that since 1965 this country has increased the number of jobs by 50 percent?

Mr. GORDON. That is extraordinary.

Mr. FREEMAN. And what's the explanation? How do things fit in? At a time when Europe is losing jobs and Japan is creating jobs only nominally, we have been creating more jobs than at any time in our history, in the last 20 years.

Mr. GORDON. That's really extraordinary. I can only give my obvious answer. The economy has expanded. It's because our product is in demand. It's because our exports have grown to the point where production is required and can be supported by the economy.

Mr. FREEMAN. Let me add to this. It's not in big business. It's not in government. It's in small entrepreneurial initiative businesses.

Mr. GORDON. I really suspect that's correct. Once again, the innovative behavior of small business comparing innovation in small business with innovation as a whole, small business wins hands down every time.

Mr. FREEMAN. Even during the recession in 1979 to 1982, we were creating jobs like gangbusters.

Mr. GORDON. In the small business community.

Mr. FREEMAN. But in numbers. Today, as a proportion, there are more people working in the United States than at any time in the history of this country, about 60 percent.

Mr. BROWN. I'm not familiar with the demographics in terms of age, say, in Great Britain, but I would imagine that as a group their population is generally older than ours. Am I correct?

Mr. GORDON. I don't know but I tend to believe that.

Mr. BROWN. Do we have any demographic experts that can say one way or another?

Mr. WALLACH. Somewhat older. Belgium, Austria and Sweden are very much older.

Mr. BROWN. Then, going back to this gentleman's questions in terms of job creation, I would imagine that Great Britain and a lot of Western Europe fits very nicely in this rectangular deal, so why then are they having such a tremendous problem right now in creating jobs?

Mr. GORDON. I think it has less to do with age than the economic structure, less to do with the age distribution of the labor force than the economic structure and economic condition that those countries face. This is not the only thing that determines the economy obviously.

Mr. BROWN. I realize that but what I am saying is this, don't you also have some other problems there? You have a maturing social structure, right? Assuming that all of the medical research doesn't exactly turn out a new deal every day, who is going to support those people the older they get?

Mr. GORDON. That's really an important issue and probably a gut issue for the United States in the next 20 years. How are those people who are not working or who are socially dependent because of the diseases that you talked about before, the disabilities, how are they going to be supported?

If you look at the demographics in the United States and look at the baby boom bulge and their children; as the baby boomers retire, the people who will be supporting them through social security are those people born in the 1970's and early 1980's. There is a dip and the dependency ratio goes way up.

If retirement age stays constant, or diminishes, our guess is that people will want to work longer where work is defined not as a primary job but as doing something you like. You think the pattern is going to be you work at your job, you get your pension, and you go off and do something you would like and you earn some money.

Representative FASCELL. Mr. Gordon, the suggestion is about to emanate here that the zero population growth in the United States, which I understand—don't hold me to the statistics—was zero last year and the year before, except for a small amount of growth due to illegal immigration, is not a good policy for the United States.

Mr. GORDON. Do you want me to comment on that?

Representative FASCELL. Yes.

Mr. GORDON. I don't think we have reached zero population growth, nor will we for several decades. We are growing about 1 percent a year, but I would contest whether or not that is a useful policy or not.

Certainly, if we look at the poorer countries——

Representative FASCELL. If it is not useful for us, why is it useful for anybody else?

Mr. GORDON. I think it is useful for us, and I think it is useful for them. When we look at a curve like this, the human suffering that is embedded in that curve is enormous. Here are these young people that are being born in countries that will have an insufficient time providing them with any kind of occupation, with any kind of future to look forward to, and the feedback to the United States is a world in turmoil.

I can't put it in simpler terms.

Representative FASCELL. I happen to agree with that, but there are a lot of people who don't.

Mr. GORDON. I am sure of that. Thank you very much.

Mr. BROWN. One last question before you sit down.

Do you envision a liberalization, for example, of immigration policies?

Mr. GORDON. Immigration is a difficult area. I thought someone would ask me that.

Would anyone else care to answer that question?

Mr. BROWN. I am just trying to live up to my billing.

Do you envision the liberalization of immigration policies?

For example, if we have a wonderful, wealthy country, such as the United States and, you know, Western Europe and you have these poor countries over there in that pyramid, I would imagine that those folks will try to go where the jobs are.

Mr. GORDON. Without telling you how, I think that liberalization of immigration is almost certain, beginning between the United States and Mexico. Mexico's population growth rate was 3 percent per year. That has started to come down also.

Mexico looks like that pyramid. Mexico has a problem in providing jobs for its people. We are a neighbor of Mexico. Mexico can't understand why we are not opening our arms to some of these people. It is not its worst people that are coming across the border, and those jobs that those people will fill are jobs that need filling.

So the pressures are in the direction for liberalization ultimately.

Thank you.

Representative BEDELL. Thank you very much.

Our next speaker is Jay Forrester. We have already introduced Jay, and we will hear from Jay. Then we will have questions of him and Ted as well.

REMARKS OF JAY FORRESTER, PROFESSOR, MIT SLOAN SCHOOL OF MANAGEMENT

Mr. FORRESTER. Thank you, Congressman Bedell. I am pleased to be with you this afternoon.

I will shift the timeframe of our discussion from that interval between now and 2030 to that interval of the next 10 or 15 years.

The theme of today's conference is the new economy. We are indeed moving toward a new economy, not only in the changes Ted Gordon has mentioned but in others. However, the form of that new economy is not going to become entirely clear until around 1995. In the meantime, we will be busy extracting ourselves from the old economy and laying the foundation for the new.

To understand more clearly present economic conditions, one should consider the overlapping effects of two different processes that are at work in the economy.

First is the ordinary business cycle fluctuation that runs its course in some 3 to 7 years between peaks.

Second is the economic long wave, which is also called the Kondratiev cycle. The economic long wave is a major rise and fall of economic activity, which spans 45 to 60 years between peaks. The long wave is a much larger and more important disturbance than the businesss cycle.

You are all familiar with business cycles, but perhaps I should review the behavior of the economic long wave.

The long wave consists of rising economic activity for two to three decades, a broad peak some 10 years wide, then a rapid drop into a major depression that can persist for a decade. After the depression, another long-term recovery starts.

Some of us at MIT have been drawn into considering the economic long wave through our work on the system dynamics national model. The national model works substantially differently from the more familiar econometric models. The national model is built up from the operating policies within corporations and government rather than from macroeconomic theory. It is derived from management policies as observed in the practical working world rather than from statistical time series representing aggregate economic behavior.

The national model generates from reactions within its internal policy structure the same patterns of change that have been observed in real life. The model exhibits short-term business cycles of 3 to 7 years duration. Under appropriate circumstances it manifests stagflation and reveals the causes of simultaneously rising unemployment and inflation.

Also, from the interactions within the private sector and between the private sector and government, the national model produces an economic long wave of some 45 to 60 years between peaks.

The national model provides for the first time a cohesive theory to explain how a major rising and falling economic pattern spanning a half century can be systematically and internally created within an economy. The long wave is an alternating over and under accumulation of capital plant.

In Western industrial economies, capital accumulation has been concentrated in periods of economic excitement lasting some three

decades. Such periods of aggressive new construction have been interrupted by major depressions occurring in the 1820's, 1890's, and 1930's.

Now, after the expansion of the last several decades, we are probably entering another such economic downturn along with overbuilding of capital plant, rising prices, leveling out of productivity, speculation in physical assets, rising unemployment, and accumulating debts. Debts which were taken on during expansion with the expectation of rising prices and profits become burdensome when profits decline and interest rates remain high. Banks must write off uncollectible loans. Speculatively elevated land prices must be readjusted downward to come into balance with wages and salaries.

The interaction of these two economic functions, the business cycle and the long wave, are far more important to understanding current economic conditions than are either economic ideology or changes in political parties.

Current economic difficulties have been developing steadily for 20 years, regardless of changes in political parties. Similar economic problems now exist in most other countries, even those with very different political philosophies.

Under the surface I believe there is something going on that is much more fundamental than the political issues now monopolizing debate in government and the press. Appropriate actions can affect economic behavior, but without a deeper understanding of economic forces, those forces drive the political responses rather than political actions controlling the economic forces.

Over the last 20 years, the amplitude of the short-term business cycle has been steadily increasing. The last several recessions have been progressively more severe. We believe that the growing variation in the business cycle is a natural consequence of approaching and going beyond the peak of the economic long wave.

In the 1950's and 1960's, business cycles were restrained on the downside by excess demand and on the upside by shortage of manufacturing capacity. As demand has now leveled off and capacity has continued to expand, those restraints have been removed. Without the boundaries imposed by pentup demand and limited capacity, the business cycle peaks have become higher and the recessions deeper.

Business cycles are superimposed on the economic long wave. The centerpoint of business cycle fluctuation is carried up and down by the slow rise and rapid fall of the economic long wave.

To illustrate, one can think of the long wave as being like the rise and fall of tide in the harbor, on top of which business cycles are like the waves produced by wind. I believe that we are now past the economic high tide and that for the next decade the economic tide will be falling. Business cycle recessions will become progressively deeper, and each business cycle peak will fall below the previous high.

One might wonder about the plausibility of a long downward move in economic activity while we are in an unexpectedly strong business cycle recovery, but the current recovery is consistent with the picture I have been describing. The business cycle can become larger when the economy moves beyond the long wave peak. For a

time the short-term business cycle recoveries can temporarily obscure a longer term decline.

To illustrate important trends that have been building up from the long wave, consider four economic patterns of recent decades.

First, unemployment. Unemployment for the last 20 years shows a business cycle fluctuation superimposed on a long-term upward trend that is being created by the long wave. Every peak of unemployment has been higher than the previous peak. Every low point in unemployment during business cycle expansions has been higher than the previous low point. The present reduced level of unemployment is still above the last low point in 1979.

There was no change in the behavior of unemployment between the liberal monetary policy of the 1970's and the slightly more restrictive policy of the last 10 years. Federal Reserve policy has had little influence.

The behavior of unemployment we have been observing during the last two decades is deeply embedded in the economy and is more fundamental than anything that has been happening in Washington. Political actions tend to focus on low leverage policies rather than the few high leverage policies through which economic trends could be influenced.

Second, Government deficits. Government deficits have also been following a long-term trend independent of the political policy of the party in office. On the average, deficits have doubled in each 4-year administration for the last five administrations. Political action has been driven by economic factors rather than the reverse.

Third, prices of agriculture lands. For 35 years the price of farmland has been rising faster than the cost of living index. While the general price level has risen about threefold, the index of agricultural land prices has risen tenfold.

For two decades land has been seen as an inflation hedge; that is, its price has been rising faster than inflation. People bought land to protect themselves against inflation, thus further driving up the price of land and creating still more incentive to buy land.

Interest rates were less than the inflation rate of land. By borrowing money to purchase land, the purchaser at the end of the year had more appreciation in land value than he had interest to pay. The borrowing itself created more money, therefore more inflation and, as a consequence, still more incentive to buy land.

But such a trend of land prices rising faster than the general price level cannot go on forever. In time the price of land rose until it was to far out of balance with other prices in the economy. The imbalance became so great that in some areas the interest payment on a land purchase was several times the agricultural rental value of the land.

Excessive land price is now beginning to be corrected. The official price indices for agricultural land show declines of 10 or 15 percent, but in some areas land this year is selling for half the prices that were paid 2 years ago.

On mortgaged land, farmers' equities are being wiped out and foreclosures are approaching the level of the 1930's. As we move further into the downturn phase of the economic long wave, I expect price declines of agricultural land to become more rapid and more widespread.

Fourth, real interest rates. Another indication of long run forces in the economy can be seen in the behavior of real interest rates. Real interest is the nominal bank interest minus the inflation rate.

The system dynamics national model shows a relationship of real interest to the economic long wave that is strikingly like the real interest rate pattern that has been observed since 1930. The model generates a fluctuation of real interest rates in which real interest rate becomes negative before a peak in the long wave, just as real interest rate did go negative in the 1970's. Immediately after a long wave peak, the national model produces a sharp rise in real interest rates, as has happened recently and as previously happened between 1930 and 1934. I believe that the present high real interest rate should not be blamed on the current administration or on Paul Volcker and the Federal Reserve. Instead, the present high real interest rate is part of the inherent dynamic of moving beyond the peak of long wave expansion and into the downturn.

We are now in a major transition between the economic growth that followed World War II and the economic growth that will resume again in the 1990's, but the transition is a time of readjustment and a time for correcting imbalances that have developed within the economy. The transition is a time of technological change, when many of the old technologies are laid aside and new technologies are tested and accepted as a basis for the next expansion.

The transition has historically been a time of economic depression. But the severity can certainly be made either better or worse, depending on the wisdom of the national economic policies that are adopted.

A depression period has traditionally started with a rapid deflation of the price of physical assets. In some parts of the economy that has already been happening. However, we believe that a physical depression, as indicated by high unemployment underutilized capacity, can be accompanied by either deflation or inflation.

Whether a country travels the traditional road of deflation or the less well understood path through runaway inflation depends on the action of government in controlling the money supply.

If one must choose between deflation or a rapidly accelerating inflation, deflation would be preferable. It would run its course sooner and would lay a more solid foundation for rebuilding the industrial economies than would hyperinflation followed by calling in the money supply, reissuing currency and starting the economy over again.

At MIT we have not yet had the resources to use the system dynamics national model to search for policies that might find the narrow path between inflation and deflation, but a high priority should be given to avoiding both runaway inflation and a destructive deflationary spiral.

In the next business-cycle, recession debt loads will become far more burdensome. Foreign debts have so far received the most attention, but they will soon be joined at center stage by the U.S. Government debt, by mortgages on land, and by loans to weak industrial corporations.

Developing countries even now do not have sufficient margin in their balance of trade to make repayment of their debts likely. The

next recession will reduce their financial solvency even further. Pressure to repay loans is already creating internal political forces that will lead to new governments that will feel no obligation to repay. The next governments of debtor countries will argue, with some justification, that the original loans were unwise on the part of the lender as well as the borrower and that the lender was equally to blame. Eventually, the only escape will be default.

Foreign loans subject to default equal more than the net worth of the entire American banking system. Reverberations from such defaults will shake the financial structure of the country and the world. Plans should now be made for how to handle such defaults to minimize the harm they can do.

But the U.S. Government is in much the same situation as the developing countries. U.S. Government deficits and debt are mounting rapidly. The pace of mounting debt will tend to accelerate in the next recession as tax revenues decline and demands for transfer payments go up.

The U.S. Government is now borrowing money to pay the interest on past debt just as are the developing countries. The interest added to principal raises next year's debt, for which the interest payment will be still higher. Compounding interest into principal causes both debt and deficits to explode.

If we were to assume government revenues remained frozen at the present level and transfers and spending also frozen with only interest payments growing, then at present interest rates the deficit will double each Presidential term from the compounding effect alone. Such a runaway situation can only lead to some form of default on government debt. Unless deficits are immediately eliminated, there will probably be no turning back from default on U.S. debt. It is urgent that decisions be made now for a long-term resolution of the U.S. Government debt question.

Banks will feel the full force of the coming economic storm. Banks are at the center of the growing economic stresses. Even though most other economic actors have contributed to the economic difficulties of the next decade, the symptoms of economic difficulty will become visible by the way of the banking system. Whether justified or not, the public and Congress will apportion most of the blame to the banks. Just as in the 1930's, I expect that banks will be put back under severe regulation. The scope of their activities will be sharply narrowed, and their recently acquired freedom to operate outside their local geographical areas will be rescinded.

It would be well to curtail this present last wave of excesses now running through the financial institutions and begin to return to conservative financial practices before action must be taken in an atmosphere of crisis.

The bad news is that industrial economies seem to be headed for trouble. The good news lies in the paradox that our economies have never been stronger. When, as at the present time, a peak in the long wave has been reached, industrial countries are capable of delivering a higher standard of living than ever before. More housing has already been constructed and is available. More labor is available. Ample production capacity exists to fill our needs better than at any time in the past. For 30 years industry has been building

capital plant and thus increasing the output per worker. Productivity is now higher than ever before, even if it is no longer continuing to increase.

How do we take advantage of the favorable position we have now achieved?

Social, political, and economic innovations are needed to reduce the hazards that lie ahead and to accentuate the strengths we now have, but can we be sure of choosing the policies that will make the best of this situation?

Too often laws passed at times of crises are either ineffective, counterproductive, or too late. Intuition and political compromise are not an adequate basis for dealing with the complexity of our economic system.

But there are now becoming available new and more powerful methods for understanding economic behavior. One such is the system dynamics national model from which I have been drawing insights. It is now possible to handle more realistically how private policies and governmental laws interact and to achieve a much improved understanding of how the economy operates.

If we are to cope in the best possible way with growing economic stresses, there should be a national priority for quickly achieving a much better understanding of economic behavior.

We should reexamine our national priorities. The internal economic threat to the country is now far greater than the external military threat. Even so, the country does not strive for economic understanding with the forcefulness and adequate funding that are established patterns for military research.

It is time that seeking a better understanding of economic behavior should receive attention in keeping with its importance. Several major projects should be established, each with the goal of reaching within 3 years an improved understanding of how to avoid those policies that would make matters worse and how to find the few high leverage policies that will take advantage of existing national economic strengths.

I believe that more effective policies are possible. We have only to attack the economic problems with the same vigor and dedication that we now devote to military projects.

A bright new economy does lie ahead, but it begins about a decade from now. There is a swamp of economic difficulties to cross before reaching the rising ground on the other side. Many choices can be made in moving from here to there. Those choices will affect how smoothly we make the transition from the old economy to the new economy.

If we simply react to pressures as they arise, we will continue to be dominated by forces for which we are unprepared. On the other hand, by coming to a better understanding of how economic forces are being created, we can begin to shape policies for a more desirable transition into the new economy.

Representative BEDELL. Thank you very much, Jay, for that very optimistic projection for the next 10 years. [Laughter.]

I should introduce another one of our colleagues who is here, Mark Siljander. We are glad to have Congressman Siljander with us.

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Before we go on, Ted, would you comment in regard to Jay's analysis here as to where you might agree or disagree?

Mr. GORDON. I thought it was a very powerful talk. The importance of such models, as Professor Forrester describes, can't be overstated.

I would like to put a question to Professor Forrester. Did I misunderstand something? You said we had a 40-year cycle on the long wave, yet we are peaking now and heading down but you forecasted a bright side in 10 years. How is that reconciled?

Mr. FORRESTER. The cycle is unsymmetrical. It is a long upswing of three decades or more followed by a peak of some 10 years, which we have largely been through, then a fairly steep drop and a recovery that gets started in 10 or 15 years. Don't exaggerate the precision of these numbers, but the downturn plus the bottom is shorter than the sum of the climb and the top.

Mr. GORDON. And 10 years is that turnaround?

Mr. FORRESTER. Right.

Mr. GORDON. Thank you.

Representative BEDELL. Dante, did you have some questions?

Representative FASCELL. I had some. I was a little bit left out by the idea that monetary and fiscal policies on the national level have very little impact on the national model. Yet, when I got further down into the discussion I found out that what we have to do is get rid of the deficit and not blame Volcker and do some other things at the national level, like use high leverage policies instead of what we are doing. I am not sure what all that means.

Mr. FORRESTER. One thing I mean is that the policies haven't differed all that much from one administration to the other, that we haven't really been following any radically different policies.

An example of a radically different policy that might have had leverage in the past is if we had sharply curtailed money supply beginning in 1960, we could have prevented some of the overshoot from which we must now readjust.

Representative FASCELL. Let me restate that a different way. If we had done something about deficits, starting 3 years ago, rather than have $200 billion with a trillion coming in 10 years, we would have a different picture, too?

Mr. FORRESTER. That is right. I tried to stress several times that there are very important alternatives open. But in general we haven't taken strong advantage of those alternatives.

Representative FASCELL. Then I noted a couple of radical suggestions. At least I think they are radical. One is to reissue the currency, start from scratch. That is kind of radical.

Mr. FORRESTER. If we go through hyperinflation.

Representative FASCELL. The other would be to eliminate the deficit, starting tonight.

Mr. FORRESTER. Well, it is radical to imagine doing it. [Laughter.]

In the long run it is radical not to eliminate the deficit because of the problems it can lead into.

Representative FASCELL. Are we subjected, as a matter of national policy, simply to the monetary and fiscal controls when major economic policy seems to be out of the hands of government?

Mr. FORRESTER. The economic long wave is strongly founded in the private sector, but on the whole it has been accentuated and

made worse by the actions of government. However, there is leverage on the part of government to alleviate the situation.

My own feeling is that one cannot expect an immediate utopia with no aftermath of the excesses that we have allowed in the past. The debt is here. Something must be done with it. Much of the debt can't be paid back, so we must eliminate in some other way, probably by defaults and absorbing those defaults as painlessly as possible.

But there are many things that can be done to minimize economic dislocations. Let me state one of the most passive and inactive of the things that can be done. If we move into a time of severe economic difficulty with no widely shared understanding of how we got there, then labor will blame management, management will blame government, and the Democrats will blame Republicans. They will all blame the academic institutions. But none of them were uniquely to blame because we got where we are now by doing things that everyone supported in the 1960's and the first half of the 1970's.

It will be helpful for everyone to understand the shared blame and to realize that a political revolution will not solve the problems. Also, people need to be reassured that the economic difficulties are not going to last forever. Even without positive action, the problems are eventually self-correcting. In the meantime we should alleviate personal hardship as much as possible, smooth the transition to the new economy, and not make matters worse by hasty and ill-advised actions.

There is a great deal that can be done, even though it is short of foreseeing a return of the expansive optimism of the 1960's.

Representative FASCELL. So when we get down to the bottom and we start the upswing on the economy, one of our objectives should be to even out the peaks and the valleys and to tread that narrow line between deflation and inflation, none of which we have been able to discover up till now.

Mr. FORRESTER. We should try to find a way to tread the road between inflation and deflation as quickly as possible because that choice is right in front of us now.

Representative FASCELL. I certainly agree with you that a national commitment is necessary. I think we need to put funds and effort behind it in the same way that we did when we went to the Moon. I agree with that.

Mr. FORRESTER. Our work at MIT now is being supported by about 40 sponsors in the private sector and the Government of Canada but there is no support at present from the U.S. Government. This is indicative, I think, of our weak national attention to understanding economic behavior.

Representative FASCELL. They are too busy blaming the political parties and ideology to worry about that.

Senator HEINZ. Professor Forrester, as I understand the reason for the dropoff at the peak of the long wave, as you explained it, there is an overcapacity that causes a collapse.

We are going through a period, strangely enough, where we are not building any capacity. We are already collapsing capacity. What investment there is, is being concentrated, at least at the present time, in very short-term investments.

Why isn't this a self-correcting factor that is going to smooth out the faults of the trough before we get down as deep as you predict for us?

Mr. FORRESTER. We are in the process of correction. The 10-year depression periods are the times of correction.

As you correctly state, we are not adding capacity in many industries and not adding much to the economy in its entirety. We are sitting here with a peak of capacity, a lot of capacity that is not being used. We are waiting until that capacity is physically worn out and depreciated on the account books, and until we are ready to rebuild.

During the time that we will be waiting, the companies and the jobs that had been devoted to building that capacity will be going out of business. Discarding obsolete productive capacity is part of the trauma. Then when we get ready to rebuild, two things happen. The capability for rebuilding has already gone out of business, so we don't have the ability to rebuild. And, second, new technologies are coming into view, so we will not want to rebuild many of the old technologies.

A depression is a window of opportunity for new technologies. We will see there is something new and better that we want to build, but we will not have the immediate capacity to build. Therefore, there will be an undershoot in the amount of capacity because we don't want to rebuild the old technology, and we haven't established enough capacity to build the new.

So there will be an undershoot in capacity. Go back to 1945. We had been through the depression and World War II. In 1945, there was a severe shortage of capital plant at every level in society—homes, automobiles, household appliances, office buildings, schools, and factories. Everything was deficient in capital plant.

We did an absolutely magnificent job of rebuilding capital plant in 20 years, from 1945 to 1965, and then we overbuilt. Now capacity is so much overbuilt that we can coast through the next 10 or 15 years while the decay of the old capital plant goes on and while we decide what the nature of new capital plant is to be.

So this is a time of hiatus. Such is the traditional pattern of suspending capital construction while the shape of the new economy becomes clear. The timing can be adjusted some by understanding the process, so people can more quickly see what comes next. But the transition cannot be shortened to a year or two because there is much that must be understood and tested.

Take the matter of the energy crisis. For 10 or 15 years we have been trying to decide what to do about energy. One of the main reasons we can't decide what to do about replacing oil is that the oil economy is still working very well. There still is oil, and there is relatively new refinery capacity. Oil is serving very well, and we will wait until that is no longer true and until the incentives become greater and the technical solutions become clearer.

New technologies will not be determined either by a political process or even by scientific/technical debate because they must be first demonstrated on a small scale and then given time to grow.

It is a long process of demonstrating the success of a new technology and gradually getting it accepted and gradually beginning to find out how to finance it and gradually training the people in

the technical universities to understand the new technology instead of what they have been studying in the past.

There is a whole infrastructure to be built that doesn't just come into being in a year.

Senator HEINZ. To those of us in politics, there is a depressing inevitability about your long wave theory that suggests that we should either retire or find interim employment, so to rise from the ashes.

Mr. FORRESTER. There is another alternative. [Laughter.]

There is another alternative and that is to become an economic statesman. We need leaders who look at the actual situation realistically and begin to work toward what can be done. We need leadership in understanding economics in the political settings. There is a great deal of opportunity.

Senator HEINZ. And while we are at it, don't blame anybody.

Mr. FORRESTER. And don't blame people who aren't to blame.

Senator HEINZ. Don't blame the failed policies of the past.

Representative FASCELL. Senator, there is another caveat I think you would have to add to that, and that is in order to be that economic statesman you had better be sure your people will let you be.

Mr. FORRESTER. Your people will let you be an economic statesman if you understand what is going on and can make it persuasive. That is what I mean by being an economic statesman.

If you have an internally consistent story to tell that makes sense and hangs together, I believe you can get the support of your people.

Senator HEINZ. If you have an internally consistent story to tell, it should be a snap because think of all the totally inconsistent stories that have instant credibility. [Laughter.]

Mr. FORRESTER. There you put your finger exactly on it.

Representative BEDELL. Bob Edgar.

Representative EDGAR. Actually, I have two questions that may be a little bit contradictory, in response to Senator Heinz and his question.

I wonder if Jay Forrester might give some of the specifics that he would suggest in terms of the short term. What could elected officials, who you wouldn't want to blame, in fact do?

I also have a broader question besides the specifics of where we go from here? Much of what you say is based on some modeling of what is going to happen in terms of long waves, short waves, and a predictable basis. I wonder where you get the optimism that our future over the next 5, 10 to 15 years is predictable in terms of previous signposts and whether or not the Arab oil embargo of 1973 and the discovery of Love Canal and the Valley of Drums and the toxic disposal sites and the transition and change that we have experienced over the last 10 years haven't, in a sense, stimulated not only a new economy but a different world order, world view, that is not easily predicted using old models.

Mr. FORRESTER. In spite of all the beliefs to the contrary, I don't think the oil crisis was very important to what we have been talking about today.

With respect to pollution like the Love Canal, we put out a couple of books in 1971 showing that one of the great crises of the

future was going to be rapidly escalating pollution. That was well before the discovery of Love Canal. The fundamental driving force behind both energy shortage and pollution is rising population.

You can see the population pressure in the data that Ted Gordon gave us earlier. I do differ with the comments made about immigration policy a moment ago. If one took those two demographic profiles of Ted's and simply add them together; that is, if one split apart the Third World profile and put the developed countries profiles right in the middle, then the demographic pattern for the world as a whole would look just like the developing country pattern. It means that if free immigration is allowed between those countries that he labeled as "developing" and those countries that have the rectangular distribution, then all countries will have the problems of the developing countries.

The most fundamental decisions we must make are the decisions about population growth and immigration because the advantages of the developed countries can be overwhelmed by free immigration.

Population is an ethical question that has to be faced because the population problem of the developed countries is just as severe as the population problem of the developing countries. Few of the developed countries are able to support their present populations at their present standard of living from inside their own geography.

The most extreme example is Japan. Japan, without foreign resources, without foreign energy, and without foreign markets, would be a disaster area. Yet Japan is moving toward that day.

There is a tremendous significance to the population and immigration problems, that are tied into the longer range issues.

Representative EDGAR. I think that is the point of my question, and perhaps the oil crisis and the toxic waste problem were not the right illustrations, but in January of 1960 we had a population of 3 billion. In January of the year 2000, we will have a 6.2 billion population.

It seems to me that the population pressure of the Third World might change some of the models that we used previously.

Mr. FORRESTER. Well, there are models that have been taking population and resources into account and models that do not. For those models that haven't taken population into account, you are right. But, on the whole, the issues that are important for the next several decades can be taken into account sufficiently, realistically.

Let's discuss the alternative to computer models. What is the alternative? The alternative is to act on the mental intuitive models that we otherwise carry around in our heads. Every action we take is made on the basis of models. One has no escape whatever from using models.

Those images in one's head about the nature of the country are not the real country. They are models, images, extractions. The question is: Do we understand those mental models, can we discuss them, can we debate them with completeness and understanding?

To understand the mental models, we must bring those models out of people's heads, set them down, say specifically what is meant, and let other people debate the assumptions.

The kind of computer models I am talking about are drawn out of people's heads, out of the mental models we are otherwise using,

and out of the knowledge of how people are connected together and the policies they are following.

The differences between computer models and mental models are that computer models become more explicit, more comprehensive. Computer models allow us to know for sure the implications of the assumptions that are being made. We can't be sure of the consequences of the assumptions in our mental models. Converting to a computer model doesn't make a model correct, but it does show what follows from the assumptions that are being made.

The national economic model that I spoke of is in its twelve hundredth version. It has gone through a tremendous number of improvements, modifications, and extensions to come closer and closer to representing what goes on in the economy.

One can't do such revision effectively with mental models. The question of confidence in models is a relative question. There is no possibility of guaranteeing that a model is right. There is only a choice of whether you have greater confidence in one model or another. You will never get to a position of certainty. But, I do assert that we can get to a position of better models than the mental models that are now being used.

Representative BEDELL. Ted Gordon, did you want to add something in regard to the deliberations?

Mr. GORDON. If I may.

I certainly agree, Professor Forrester, that the issue of population is ethical. Completely open borders is not what I meant to suggest with liberalization of immigration, and I think we may have different policies with respect to countries that are closest to us, such as Mexico.

I would like to also add a remark with respect to modeling. I am a modeler also, and I think the statement that Professor Forrester makes about models to explain the consequences of our assumptions is in fact the real power, to write the assumptions down and see what their consequences are. No one says that is true. All one can say is, I have been systematic in making explicit my assumptions and in tracing those assumptions through to their conclusions.

A direction in modeling today which we find very promising is the treatment of models in a probabilistic sense, rather than a single value forecast, a range in possibilities that the assumptions lead to, so that the future is not single, predetermined—irrespective of what we do, there it is—but rather, this is the range in which we have to work.

If we do this, we can do the upper end or the lower end, and an explicit part of decisionmaking today is understanding the uncertainties that the models project which is very helpful.

Mr. FORRESTER. You shouldn't accept the output of any model on the basis of what the originator says, without yourself or someone in whom you have confidence, looking carefully into what the model contains, what the nature of the assumptions are, and are they more acceptable assumptions than are otherwise being used.

It's only through that process of review that better understanding will come. It is necessary to participate, either personally or through a member of your staff, until you trust the assumption's and output of a model. It is very like debating with someone else

about his mental model. You press him on his assumptions, what he's saying and try to decide whether you're going to believe him or not. With a computer model you can get at the issues more completely, but the process is still the same as with mental models.

There is no shortcut to working on becoming an economic statesman.

Mr. GORDON. One final comment on models. All that having been said, let's recognize that models have often, perhaps most often been wrong and that there's a very big tendency, present company excepted, for modelers to fall in love with their models and forget that they're only very partial representations of the real complex world.

In support of the comment made before, structures change and models embed those structures and don't recognize that. And those problems are real.

Representative BEDELL. Several people wanted to ask questions, but we haven't heard yet from Warren Brown.

Mr. BROWN. Correct me if I'm wrong, Professor, but at one point in your comments, you seemed to be moving dangerously close to what is called "industrial policy," some type of quantitative approach to solving such things as Federal deficits and also maintaining an adequate capital base. Are you?

Mr. FORRESTER. By "industrial policy," you mean the Government taking a position on what industries should be supported or developed?

Mr. BROWN. By industrial policy, according to those people who have advanced the idea, certainly, in the auto industry, meaning that somehow there's a proportion between government being involved in the industries and their work forces, meaning that somehow, at some time, you have some triumvirate of the Government industry and labor looking at those problems we're talking about.

Mr. FORRESTER. I don't believe that can lead to much. First of all, nature will have solved the current economic problems before a consensus arises out of that triumvirate.

Second, a political consensus is almost sure to come to answers that are extensions of the past, because the new technologies and the new organizational forms will not have been demonstrated sufficiently, persuasively to have much impact on the political process.

Our hope lies not in trying to decide politically what to do, but in removing barriers from the process of experimentation. For examples, most new employment now is largely coming from small young companies, not in the old ones. Some of the new small companies are going to be the big companies of the next wave. However, we cannot be sure which industries will succeed. Anything we can do to encourage trial and experiment in new products and new organizational forms should be encouraged. But do not try now to say exactly what the product will be or what the organizational forms will be.

Representative BEDELL. Senator Heinz.

Senator HEINZ. I had one brief question regarding Jay Forrester's national economic model, which is this: If you look at our debt structure today, it's pretty large and scary, $1.5 trillion for the Federal Government, about $4.5 trillion for everybody else, consumers, businesses, homeowners, and so forth, a total of $6 trillion worth of

debt. That doesn't count what we're going to be owing overseas. That represents about a fivefold increase in nominal dollars over the last 20 years. Well, so far, it supports your hypothesis about too much debt. Ironically, while debt has grown by five times over that time, investment in plant and equipment has only increased by twice. Most people point to that, and they say, "Aha, we've been investing too much in consumption and not enough in production, and that's why we are at our current low state of affairs."

As I understand the national economic model, it says, "Boy, we should have invested even less in plant and equipment, because that stuff is all going to be obsolete over the next 5 to 10 years, and maybe we inadvertently did the right thing."

What your model, therefore, says, is contrary to the conventional wisdom that we have invested too little. Your model suggests the alternative assumption that we've invested too much.

Mr. FORRESTER. We certainly take the position that the country has invested too much in physical plant. Let's look at that other part of "savings." Part of the so-called savings are really not savings at all, in the sense of investment in productive plant that has the potential for paying back the loan. Most of the investment in government debt goes not into things to strengthen the economy for future payback. The debt is mostly for current living expenses, current operating expenses. Therefore, nothing is being created for the future that produces the potential for paying back the debt.

A lot of nonproductive borrowing is going on in the private sector too. Borrowing to buy other companies, and borrowing for leveraged buy outs aren't producing additional economic strength. It's a pyramiding of debt, largely because there's not much incentive to put that money into physical plant. The incentives are lacking in the private sector for more physical plant. This is why tax laws to favor investment haven't produced any great amount of investment. The incentives are not there for substantial physical investment, yet the money is there. The money is available. Companies are accumulating money in depreciation allowances that are not needed for new investment. In the economic long wave during the beginning of the buildup, there's a great need for investment in physical plant. At the top, there is a need to liquidate investment and pay back loans. The economy moves into a phase when depreciation should be paid back to the stockholders and lenders. However, there is a great tendency not to pay back equity directly but to do so indirectly as when one company buys another. In effect, they're paying back the capital investment by not reinvesting.

Senator HEINZ. Doesn't the leverage buy out do that?

Mr. FORRESTER. Leverage buy outs may do that. The leveraged buy out does not add to the physical plant; it provides payback to the stockholders; and converts equity to debt.

Senator HEINZ. It's another issue. It sounds to me like that may be good rather than bad.

Mr. FORRESTER. No, I don't differ with the overall net effect, except that a leverage buy out increases debt without adding productive capacity. In a time of economic adversity, such buy outs may be in great difficulty.

Representative BEDELL. Dante Fascell.

Representative FASCELL. I just had one question for Ted Gordon on the question of the labor force shifting out of agriculture faster than it can be absorbed in other sectors and therefore adding to unemployment and underemployment. It sounds like a human global dynamic beyond anybody's scope, yet in the face of that dynamic, our policy, U.S. national policy, in terms of the Third World in the agricultural sector, has been to try and encourage and enhance labor-intensive activities. It seems to me that we can't even stick our finger in a hole in the dike that way.

Mr. GORDON. Your interpretation of what I said is just right. If the development process in Third World countries in the future looks like it looked in the past—there is my assumption on the table—it may look different, but if it looks the same, there's going to be unemployment in agriculture and underemployment in agriculture and labor shortages in the other sectors, but not enough shortage to make up for the overabundance. Therefore, the conclusion is, whether it's our finger stuck in the dike, or to whatever degree we can, it is the labor-intensive agricultural technologies that improve productivity and that will be most useful to those countries.

Representative FASCELL. We're trying.

Representative BEDELL. I have a question if I might, Jay. If I understand your model, the national economic model has to do with what's happening in the United States. I assume that what's happening in the world has tremendous impact on what happens here in the United States.

One question is, how does your model include world economic changes, as it affects the United States?

Second, you indicate that you thought we should not be investing as much as we have been in capital plant, yet we read that because of the fact that our automobile companies have significantly fewer robots, for example, than the Japanese companies do, and some of our steel production is not nearly as efficient as those with whom we compete in the world, the inference is certainly made pretty plain to us that one of the problems we have had is that we have not invested sufficiently in capital equipment which would make us more competitive in the world and help with our balance of payments.

Can you address those questions?

Mr. FORRESTER. To the first question, the national model is applicable to any of the developed countries. Although we've picked numbers to fit the United States, the economic long wave will synchronize behavior across boundaries. You can look upon the system dynamics national model as a national model or you can look upon it as an international model. There are strong forces that pull countries into synchronism; the depression of the 1930's was essentially worldwide; the boom of the 1960's was worldwide. The malise we have now is worldwide and especially strong and visible in Europe. Countries are tied together, so whether you call the model a U.S. model or a European model or a world model, many of the things we're talking about turn out to have the same answers. If you get more specific, there could be questions that the model wouldn't immediately answer, and the model would require extensions.

A model is for certain purposes. One can easily ask questions that a particular model can't address. If that question is close enough, you answer it by extending the model. If it's too far away, you probably start over with a different model. So each question has to be dealt with in the context of exactly what you want to know. But we see the national model as applying widely to present economic conditions.

On the second question of Detroit and American industry versus the Japanese, I do not believe the answer lies primarily in labor productivity or robots or automation. Robots will come along. I'm not opposed to robots. But productivity problems lie elsewhere.

If you look at the relative organization charts of a Japanese automobile company and a Detroit automobile company, you find in every management and white collar category of activity that Detroit has twice as many people as Japan. Therefore, they've cut their productivity in half because of high overhead. In quality control the ratio is not 2 to 1. In quality control, the Detroit company has 10 times as many as Japan, and, of course, has the lowest quality, because they're trying to impose quality by quality control groups on a process that's not producing quality, rather than getting the quality in the first place right at the level of design and manufacture.

That is a managerial failing. Some of American management has drifted away from the reasons for our success in the 1950's and 1960's. While I'm exaggerating a bit, Japanese management is doing what we say we ought to do, but which we aren't doing. Japan is doing what we used to do, but are no longer doing.

Representative BEDELL. So your feeling is that the problem primarily does not exist in the fact that the Japanese have more robots than we do, and some of the steel plants, supposedly, the plants themselves are newer and more efficient. You feel the major problem has to do with management.

Is that correct?

Mr. FORRESTER. Even if Japan has more robots and newer plant, the problem has to do with management. For example, one of my colleagues at MIT in metallurgy was through the 1960's a consultant to the Japanese steel companies. He told me his frustration in not being able to get any executive of any American steel company to go with him to see what was going on in Japan. It was beneath their notice, beneath their dignity, until they were overtaken by the Japanese.

Mr. BROWN. Can I just have one more question?

Representative BEDELL. Yes. Then I think we ought to open it up to the audience.

Mr. BROWN. I was in New York recently at the American Iron and Steel Institute meeting, and almost every steel company present there was talking about getting continuous casters and that sort of thing. But when I spoke to some of the suppliers, they said that, essentially, what the American steel industry is doing is too little too late.

I was wondering if you would basically agree with that, in terms of, say, getting technology that has been onstream since 1966–68?

Mr. FORRESTER. Yes; absolutely right. They did not rebuild when they had the profits to rebuild. They milked the assets. They kept

the old assets when they were still paying for themselves, while the Japanese invested in the new. If they invest in what Japan is now doing, they will again be 20 years behind the times. They should invest in what comes after the technology Japan is now using.

Mr. BROWN. That was a question that was put to them and the answer was that that technology is not onstream now, and that they have an immediate need to increase productivity, and if they would wait 3, 4, 5 years down the road for that new technology, they'd be that much further behind in productivity.

Mr. FORRESTER. You've put your finger on the problem. No long-range view.

Mr. BROWN. That's your word.

Representative BEDELL. We're going to take some questions from the audience.

A VOICE FROM AUDIENCE. I was just going to say that United States Steel was accused of the same short-run profit maximization policies, it has been accused of recently, 50 years ago. This is not a new thing, United States Steel was still, at that point, allowing its capital equipment to decline and maximize its profits while other investors, other steel companies were able to gain market share, because it had the dominant market at that point. This is 50 years ago. So it's not just in the 1970's and 1980's that United States Steel and other major steel producers have been pursuing these policies. These have been management decisions for half a century.

Mr. FORRESTER. And it takes them a half a century to go out of business. [Laughter.]

Representative BEDELL. Any other questions from the audience?

A VOICE FROM AUDIENCE. Professor Forrester, are you saying that the long wave economic decline in the next decade is inexorable, no matter what happens in our political and economic life, and if so, why should elected officials raise taxes and cut spending and reduce the deficit, so they can give everybody a recession anyway?

Mr. FORRESTER. Regarding whether or not a decline is inexorable, the answer has to be yes and no. We are faced with debts on the books and something has to be done about them. Almost anything you can think of is going to produce ripples. Debt could be legislated out of existence, but that's the same as default. Whatever happens is going to present a problem. If debts are paid off, it accentuates our internal economic imbalances, because paying off the debt means pulling money out of the public by taxation to pay to the bondholder. Doing so will move money from the average citizen to the more wealthy. There's an interesting question of fundamental social equity in how the debt problem is solved. Who should suffer and how much. I feel that the pain of the readjustment should be redistributed somewhat equally, and so far we're not redistributing it equally. Look at the bank situation, where we're allowing small banks to go broke, and we pay off the deposits of Continental Illinois. We dig Chrysler out of its difficulties, but not small companies. We refinance Massey/Ferguson and International Harvester, and we let the small farmer go bankrupt.

The difficulties of economic readjustments are not being uniformly distributed. There is an opportunity for legislation. Realizing we have a tough set of problems, what kind of reorganization will be most fair?

Why shouldn't the farmer have the same treatment that International Harvester has? That treatment with the big company is to move in and keep it operating. Debt is converted to equity and usually the banker comes out pretty well on that. The farmer's equivalent would be that the bank doesn't foreclose on the loan; it simply takes 20 percent of the output of the farm or whatever is an appropriate amount of rental, and that's what the lender will get for his debt, with some way for the farmer to pay off and recover ownership. We aren't ahead by forcing farmers off the land and turning them into unemployed.

We are producing upheavals in our economic system that are not necessary. We haven't thought through how to adjust the present economic stresses with the least amount of hardship.

Representative BEDELL. Somebody here had their hand up before. The gentleman in the back.

A VOICE FROM AUDIENCE. Professor Forrester, is there a somewhat popularly enthralling account of the scope of your exposition that you could endorse?

Mr. FORRESTER. What? I'm sorry.

A VOICE FROM AUDIENCE. Is there a book or article that you could endorse for reading?

Mr. FORRESTER. We have a good many papers, a majority of them not generally available in the press yet. Anyone that wants to can write to us. We can send you some and a list of others. We are in the process of writing four books covering all this, but it will be sometime before they're actually available.

In the meantime, we'll help anyone.

Representative BEDELL. Why don't you give them your address, for anybody that wants it?

Mr. FORRESTER. Just write to me at MIT in Cambridge, Massachusetts.

A VOICE FROM AUDIENCE. What is your answer to the inevitability of the default on Third World debt? How do we deal with that problem?

Mr. FORRESTER. I personally consider it inevitable. We can deal with it in various ways, like wiping out the stockholders of banks, and turning the managements out on the street. [Laughter.]

As far as the depositors are concerned, I think the U.S. public, by way of its government, has a real obligation. We have created the image that banks are regulated and safe, and that the problems of the 1930's with the banks will not recur. If we take the ethical position that all of us through our government have created that promise, then I think it may be correct that the U.S. Government is going to have to bail out the depositors, but I don't think we should bail out the stockholders and the management.

A VOICE FROM AUDIENCE. Yesterday it was announced that the commercial banks agreed to a rescheduling of Mexico's commercial debt.

Is that a significant development? Is that a drop in the bucket that's really not going to accomplish much?

Mr. FORRESTER. It's just a statement that we're in trouble, a statement that they can't pay their debts and their interest, and we will temporize for a while, maybe for 3 to 4 or 5 years. For a time, banks will find ways of avoiding facing up to the issue. But as

long as developing countries are not able to pay either the interest or the principal, sooner or later the bank regulators are going to realize that their necks are on the line, and then the house of cards will start coming down.

Mr. GORDON. If I might just add, as we look at wealth-creating capability in Third World countries, our feeling is also really quite pessimistic, in terms of the ability of the economies to create enough surplus to pay back the loans on the original terms; however, our ultimate conclusion is not necessarily as pessimistic as has just been stated. Rescheduling of the loans, creating a set of institutions which help the Third World countries get back on their feet—I put that in quotes and underline—may let it survive and maintain stability over a long period of time, despite the problems of repayment.

A VOICE FROM AUDIENCE. Professor Forrester, I find it somewhat curious, your remarks and your pessimistic view toward trying to institute some new cooperative framework for working out the enormous problems that obviously face us in the future, whether they be dealing with Federal deficits, international debt situation or the international competitiveness of U.S. industry. It seems to me that part of what you're saying is that the actions that we have taken over the last few years have been basically ad hoc decisions and that no matter who has been in power, we've not fundamentally taken long-term views toward our economic problems.

Part of the reason is that it has not been based on adequate data in an effort to strive toward better modeling. I think, as you would say, and an understanding of what the assumptions are behind our economic policy, the drive toward more cooperative consensus between government, business, and labor, I believe, is an attempt to get at that problem. And I just find it curious that your reaction to that is very pessimistic.

Mr. FORRESTER. My reaction is pessimistic only because actions are not being based on any new way of understanding better. Better understanding must be developed, tested, discussed, debated, and accepted.

Nowhere else in our society would we deal with complexity the way we do in our social and economic affairs. If we want to go to the moon, we don't just turn blacksmiths loose to build a machine without any analysis, without any building of physical and computer models. To build a new oil refinery, one doesn't just build it without prototypes, or without a large amount of computer modeling of how it will work.

We are not adopting into the economic system the methods that have been proven and work in complex systems in technology. In the past we couldn't, because those methods were not developed far enough to deal with the much greater complexity of the socioeconomic system. The socioeconomic system is far more complex than anything that has been done in technology, but the methods that have been developed in dealing with technological complexity are now far enough along that they can be applied to the issues we're talking about here.

Understanding social and economic behavior is a new frontier for modeling. We have for 100 years been through the frontier of science and technology. The next 100 years is the frontier of under-

standing our social and economic systems. It's the same magnitude of undertaking as coming to understand physical science and its applications.

Representative BEDELL. Thank you. Do you have a followup?

A VOICE FROM AUDIENCE. If the cooperative relationship could be built on a better data base and a better analytical capacity, would it be your opinion that it would be worthwhile?

Mr. FORRESTER. Absolutely, because the better analytical capacity will not work until it is accepted by those constituents that you suggest. A better economic understanding must penetrate the political operating world. Labor, government, unions, are that world. The methods I'm talking about cannot succeed until they have become understandable enough, clear enough, discussed enough, by those constituencies to form a national viewpoint.

A VOICE FROM AUDIENCE. Professor, I want to follow up on a question that my colleague, Bob Edgar, started to ask. I think those of us in Congress feel a certain frustration. I took four or five pages of notes on your commentary, which I thought was very enlightening, but you first gave me a sense of the inevitability of all this, then a sense, maybe, that we can do something about it. Then the idea of finding a model that I believe in and talking to my friends and confidants, then a sense of urgency about it.

When I try to put it all in my mind, I think, "Well, what really are we going to do next year or the year after?" And is there some big gap that we always will have to endure between that which learned people come up with as the problem and that which those of us who have to face the practical necessities of everyday political life and don't have a chance to come up with models and all kinds of sophisticated ways of looking at this can deal with?

What are the short-term things that we should actually be doing right now and in the next year or so?

Mr. FORRESTER. You are asking me for a recommendation of the policies to be followed. We are on the verge of getting to an evaluation of alternative policies. We have not done it yet.

But let me be very forthright. The position you are taking, if we were to interpret it from the military standpoint, is that you will not pass a military budget until the military department has won the war. In other words, you are saying "show me that you can succeed and then we will do the research."

It must be the other way around. Our group at MIT is carrying the study of economic behavior on a shoestring supported by a few members of the private sector who believe strongly that better methods are needed for economic analysis.

But the U.S. Government has been asking questions as you just have about what to do now without putting up significant financial support toward finding answers.

A VOICE FROM AUDIENCE. So the answer is that we should fund the research and not expect any immediate answer?

Mr. FORRESTER. If you fund the research now, answers could be expected within 3 years with partial answers in the meantime. But 3 years from now we can have this conversation all over again if nothing has been done in the meantime.

Representative BEDELL. I am trying to do the best I can with the hands that are up. The gentleman here with the beard had his hand up a long time ago.

A VOICE FROM AUDIENCE. For Ted Gordon. You spoke of the food situation very optimistically and showed the growth in the world production of food. I think that is an important trend, but it probably follows an S curve as most trends. You have neglected some of the trends that may show that leveling off.

For example, a lot of the reason we have had this great growth in productivity is because we have been using more water in terms of our agricultural techniques, and that may be one source of leveling off, the erosion of soil.

Could you speak to some of those trends?

Mr. GORDON. Sure, In fact, the situation is a set of balancing trends. There are some new practices and some new technologies which tend to improve productivity, and there are other practices and environmental circumstances which diminish it.

The only fact in all of this is that, viewed on a homogeneous global basis, food production and people production have kept about even. Everything beyond that is conjecture.

Will they continue to do that? Is it going to be an S-shaped curve?

Yes, I think it is going to be an S-shaped curve. I think it is going to be an S-shaped curve with respect to people, and I think production can follow it for a while.

Now, I am in the area of judgment rather than fact, obviously, but I think production can follow it through the turn of the century.

Our hope is that at that point genetic techniques are so powerful and so well in place that conventional agriculture diminishes in its importance, and unconventional agriculture, that set of technologies that follow, becomes enormously important and becomes much less of a constraint in terms of the potential for bad harvests, causing starvation.

Mr. FORRESTER. Could I comment on that?

We have, I think, in this matter of population growth a situation like an onion, peeling off one restraint after another, but there is always another layer of restraint. At the present time relative to population growth, people are trying to take away the most immediate restraint, which is food shortage.

Eventually, though, we move closer and closer to crowding as the ultimate limit. We come closer to a population in the developing world of sufficient size to overwhelm the developed world. We come closer to internal social stresses high enough to trigger atomic war. Atomic war is the ultimate limit to population growth, and so there is real reason to question whether we should want to raise food production until we cause one of the more devastating forces to limit population.

By relieving each restraint as it arises, we are trying to outrun pressures that are following us at high speed toward a concrete wall. How much of that game do we want to play?

Mr. GORDON. May I respond as well?

You see, this is an interesting case, where there is a new factor and set of factors introduced that make historic patterns not neces-

sarily the progenitor of the future. The structures change, and what is changed are three things that I went over very, very briefly at the beginning: namely, the technology, contraceptive technology, simple, cheap, effective widespread; attitudes of countries which recognize the dangers of high population growth rates; and, from an unexpected, completely left field source, the rise of feminism, which encourages smaller families worldwide.

Those three things coming together have now made that curve an S-shaped curve. Where it levels off I don't know, but somewhere up around 7, 8, 10 billion out in the middle of the next century.

Can food keep pace with that?

I won't take the same position Professor Forrester took. I think that it is incumbent on people of good will throughout the world to avoid starvation and to go to great lengths to do so.

I think food can keep pace—that is the answer to your question—at least for the next 20 years through conventional agriculture augmented by these new techniques, with some danger spots in the world, as I indicated. Beyond that the hope is a new technology that can really give a discontinuity in productive capacity.

A VOICE FROM AUDIENCE. I understood Professor Forrester to say that if we started retiring the debt we would have a perverse income effect, paying the wealthy, in effect, from the less wealthy.

But if we continue to finance such a large part of the budget for borrowing, aren't we having also the same perverse effect in that bondholders tend to be wealthier than taxpayers?

Mr. FORRESTER. Not the same, but the reverse of that. In other words, borrowing is taking money from the wealthy, using it for whatever it is used for—let's say some of it at least for the benefit of the less well-off—and the wealthy get a piece of paper, which may be worth nothing more than the paper.

A VOICE FROM AUDIENCE. I would like to address this to both of you, but Mr. Gordon particularly, to you.

Mr. Gordon, you say your thinking about employment policies has gone through three cycles.

Mr. GORDON. I am sorry, my thinking about what?

A VOICE FROM AUDIENCE. Employment policies have gone through three cycles.

Initially, you thought of employment policies as having productivity and growth driving employment generation. Then you went through a period, as I understand it, of questioning the trickle-down nature of those policies. Now you are recommending that the emphasis be put directly on employment generation.

I know you have done a lot of work on this and considerable thought on it. So I would like to ask you to expand somewhat. How do you do that and maintain international competition?

In that context, would you address yourself to, say, the 35-hour week proposal in West Germany right now?

Mr. GORDON. The remark that you are referring to in my talk was directed primarily toward policy in the Third World countries, where those looking at those countries from the outside said let's do everything we can to encourage economic growth because with economic growth, with productivity growth the country will become wealthier and everybody will benefit.

Well, there is some question about whether that really happens that way. Growth per se does not necessarily affect everybody. In fact, there is some evidence to the contrary.

So my remark was intended to mean that in the future those countries, in determining their pattern of development, will probably and are probably to consider not economic development as a whole, though that is certainly a valid objective, but the way to get there in terms of employment, in terms of the steps required, because if the way to get there is job intensive, labor intensive, the social structure that results may be more favorable than otherwise.

So I will extend the remarks now to be developed countries, and ourselves particularly, if you would like me to.

A VOICE FROM AUDIENCE. If you would then expand on your thinking in the developing countries particularly, say, for example, in the agricultural sector. You mentioned the introduction of tractors and chemicals and fertilizers and such.

How do you balance the need for employment with the need for international competition?

Mr. GORDON. That is difficult, and they are often contrary objectives.

Ms. LUPICA. At the Congressional Clearinghouse on the Future, we have recognized two major trends: One, global interdependence; the other, a very strong American movement toward decentralization, with cities now—even beyond States—taking on a very competitive role, competing with other cities and other States for corporations and jobs.

How do we mesh the strong decentralist movement in this country with what is happening worldwide? How do we become interdependent at a time when within our own country we are becoming very decentralized?

Mr. FORRESTER. There is a movement toward decentralizing industry, as well as cities and States. This is not very visible yet except that increased employment is almost entirely from small businesses. If anything, the large business employment has declined.

That is the handwriting on the wall demonstrating ineffectiveness and inefficiency of big business, as it has developed into an authoritarian hierachy, and a very deep inefficient hierachy.

I have just come from a three-day meeting on what is called the "new management style," held by a group of chief executives who are experimenting in their companies with this kind of decentralization, getting away from the hierachy, and in fact defining a totally new role for top management.

The top management role in that new concept is the role of being the designer of an institution, not the operator of an institution. It is the difference between designing an airplane and piloting an airplane.

And in corporations there is as yet little concept of the counterpart of the airplane designer; namely, the person who creates the social structure that can be successfully run by the average kind of people that will be available to run it.

A new management movement is going on underneath the surface. It is in response to pressures from the downturn of the eco-

nomic long wave. Centralization and high overhead have been overdone in institutions and a correction is starting.

The utility trusts of the 1920's fell apart in the 1930's. Big organizations overshot their economies of scale. They become less efficient. Take the steel industry as an example. The new small, mini steel mills are quite successful economically. They are competing with Japanese steel. It is an indication that the problem really was waste, inefficiency, and obsolete concepts.

As to the international economy, I think we are also at the end of the swing of interdependence whether we like it or not, and I don't regret it as much as many people do. Whether we like it or not, international trade is going to decline. Trade barriers are going up in the face of economic difficulty. In many ways it is a good thing because the scale of operations are much more manageable at the national level than at the international level. As the international economy breaks apart, there is more opportunity for experimentation and more likelihood that new leadership will emerge.

The forces now at work will reduce the degree of international interaction we now have.

Representative BEDELL. We are 2 minutes over. I have just turned down Mr. Freeman on something.

Bob Edgar, did you want to add something before we close here?

Representative EDGAR. I would just like to thank our panelists and all the people in the audience and indicate two additional events that we have on the schedule.

The next panel will be starting at 20 minutes to 4 and will be a lively debate. I am sure some of the loose ends of our discussion here will also be raised with that new panel.

Then I draw everyone's attention to the dinner that is scheduled for tonight with Robert Hormats. I hope that those who have signed up will participate in that.

Representative BEDELL. I want you to know we have controlled the votes very, very carefully. We have come to the end of time, and there is just time for us to go vote.

I want to echo what Bob Edgar had to say. I want to thank you for being here.

I might, real quickly, teil you that when I first heard Jay Forrester's projections I felt, as some of the questions have indicated here, it is kind of a hopeless situation. We can't do anything anyway.

I think actually quite the contrary is true. I don't know if he is right or wrong in his projections. I am sure he is not 100 percent right. I think he probably would not question that.

But to the extent that he might be right, it seems to me it is all the more important that we have a government that cares about the people and is concerned about what happens and helps carry us through these difficult times that we may face.

So it seems to me that those of us that are in this room and that have to do with government, have a challenge if he is correct. The challenge that we face may be even greater than it would be if everything was going great and there weren't any of those problems that he may possibly project.

Mr. FORRESTER. I think it is a great opportunity.

Representative BEDELL. Problems are opportunities, and I guess we have the problems.

Thank you very much. [Applause.]

[Whereupon, at 3:32 p.m., the conference recessed, to reconvene at 3:40 p.m., the same day.]

INTRODUCTORY REMARKS OF HON. DAN LUNGREN, A U.S. REPRESENTATIVE IN CONGRESS FROM THE 42D CONGRESSIONAL DISTRICT OF THE STATE OF CALIFORNIA

Representative LUNGREN. I think that we are in between votes. I just heard we have another vote, but rather than delay the presentation I will make an introduction of the two major panelists and then go vote and try and collect my colleagues to come back. So we can have the comment and discussion time.

During this century we've seen world-wide industries and economies become inextricably linked. Thus, American industry must carefully attempt to track and forecast their national industrial shifts and their effects on the U.S. economy. We have with us today two gentlemen with expertise in this field.

Our first speaker, Mr. Bill Schweke, is the program director for the Corporation for Enterprise Development. He will discuss American venture capitalism and entrepreneurial growth, as well as the incentive needed to encourage such investment and growth in the United States.

Mr. Schweke will be followed by Orville Freeman, a well-known agricultural expert, who has had much government service and now serves as chairman of Business International Corp. He will relate an industry perspective in the world-wide environment.

After the two have made their major presentations, I'll be joined by three of my colleagues: Representatives Stan Lundine of New York, Robert Edgar of Pennsylvania, and Claudine Schneider of Rhode Island, as well as Monroe Karmin, senior editor of U.S. News and World Report, in giving reaction and comment. I might mention that my colleagues and I have had an opportunity to review the prepared remarks of the two speakers, so we will not be commenting or reacting without having the knowledge of what they have presented to you, although we will have to go vote and then come back following that.

So, please welcome Mr. Bill Schweke and Mr. Orville Freeman for their presentations.

REMARKS OF BILL SCHWEKE, PROGRAM DIRECTOR, CORPORATION FOR ENTERPRISE DEVELOPMENT

Mr. SCHWEKE. Thank you very much. What I essentially want to do in this presentation—probably some of you have copies of the paper I'm going to deliver, which goes into great detail on my remarks.[1] You can get some additional copies from the Clearinghouse. If there are any problems obtaining it, you can talk to me afterwards and I can send you a copy.

What I essentially want to do is the following. This is a big topic. For example, there are questions such as: What international in-

[1] See appendix for Mr. Schweke's paper.

dustrial shifts are going on, how vital are these, what about the American ability to compete, what about venture capital and entrepreneurship, what is happening in different industrial sectors? What's going to be their future? And what are appropriate public policies?

This is a vast area to cover so what I'm going to be doing in my remarks is taking a particular slant on things. I work for a small organization here in town that does a number of things. It puts out publications, does research, etc., but we also do policy development, technical assistance for the States, mainly, with State governments. We are now working for the Governors of Michigan, Ohio, and South Carolina.

We work on the issue of entrepreneurship. What are ways that State governments, and for that matter at the local and Federal government level, what are ways that they can encourage entrepreneurship? What are ways that they can lessen the barriers for enterprise development? What are ways they can lessen the barriers for women and minorities to get into business? Last, what are ways that government can foster, either through affirmative programs or eliminating programs that get in their way, more or less alternative forms of entrepreneurship, like employee ownership, cooperatives, community development corporations, etc.

That gives you just a little bit of background. For the question and answer period we might even be able to talk a little about what's happening in the States as well, because in a sense they are laboratories for this country. Basically, what I'll be talking about is an argument for why we need a national entrepreneurship policy and why entrepreneurship, in a sense, is a little bit different than small business. People often times equate the two and I see an important distinction.

Small business policy is concerned with keeping small businesses in business. In a sense, what are the ways to assist small businesses to stay in business, to continue competing, etc. What are ways to help out the mom and pop stores, etc?

What I'm more interested in is entrepreneurship of a different sort. What are ways to help people get into business? What are ways to give more people a chance at that and what are ways to encourage that smaller percentage of small businesses which are new and young firms, that have the potential to grow and prosper and become the new Apple Corporations, etc. What are ways to encourage that 10 or 15 percent of small businesses which create the vast amount of jobs which are now ascribed to small business?

So, essentially what I'm going to be talking about in this presentation is what I call the new frontier of job creation which I think has to do with entrepreneurship, which is not to say that big business job creation is not important, but I'm just focusing on the independent entrepreneur. Essentially that's what we'll be talking about.

The American economy is going through increasing difficulties. We are all aware of these sort of things. The jobless rate at the end of each recession and the beginning of each upturn is higher each notch over the last 20 to 30 years. Product cycles are speeding up. There's a whole series of other symptoms that indicate that our economy is in some trouble.

You have situations where three-fifths of the families living below the poverty line have at least some members who work every week of the year. Blacks right now comprise about 12 percent of the population but hold only 4 percent of the Nation's personal wealth and very little of that wealth is in investment producing assets. This situation presents a set of problems having to do with their tapping that kind of informal network of capital—friends, family, and associates—for going into business.

There are the problems of plant closings that we are all aware of. Approximately 900,000 manufacturing jobs have been lost every year since the mid-1970's. There are the problems of resource depletion. Other experts cite problems of agricultural farmland loss and problems of water shortages. Our productivity increases are lower than places like Japan, and a number of other countries are on the verge of surpassing us even in absolute productivity levels.

There are problems of trade balance and GNP growth. There are a whole series of illustrations we can cite. This is not to say the economy isn't strong in a lot of ways, or it doesn't have a lot of resiliency, or dynamism, but they are all indications or symptoms that there are problems. Well, why is this?

I would argue that we are going through a very big, big change which probably was talked about, I'm sure, in the earlier sessions. It's a wrenching sort of a change, and I would say that we are going through four big shifts. We are moving from an industrial economy to a more or less informational economy, although these labels are kind of loose and I have some problems with them. But there is some sort of shift. We are definitely not moving toward agriculture or some of the other traditional manufacturing areas.

These areas are declining in some sense even though there is a big debate between Brookings and other people about the numbers, etc. We also are moving from an insular national economy to an interdependent economy—a global economy. That's another big change. We are also moving from an abundant source of natural resources which this country has always been fortunate to have a situation of constricting supplies and greater costs. Petroleum is a great example of what took place in the 1970's. Water is talked about and other resource shortages are being described as well.

We are also going through a rapidly changing set of demographics which affect the labor force. Formerly the labor force was of a certain size, growing at a certain size, and possessing a certain composition. That's changing as well. We have certain situations where minority labor force participation is increasingly important. The role of women in the economy is increasingly significant. We have situations with people educated for college degrees not getting college oriented jobs. A whole series of problems that, again, indicate, when you think about technological change, the needs for new skills, new types of jobs, new types of enterprises, all of which indicate that this economy is going through a major transformation.

There is a lot of debate about what all this means, in the sense of what it's going to mean in terms of the older Northeastern and Midwestern parts of the country. What's it going to mean in terms of an example like Atari moving abroad. What does this all mean in terms of living standards, employment standards, etc.? But I think we can still be pretty clear that these are the broad sort of

trends. Well, how are we going to deal with these trends? What are the proper source of tools?

Representative LUNGREN. Bill, could you just repeat those for Congressman Lundine. He just came in and I think it would be sort of useful for him.

Mr. SCHWEKE. We have in some ways a troubled economy. There are a whole set of symptoms, employment rates, productivity rates, etc. We can all agree upon certain figures and statistics. Well, why is that so? In a sense we are going through a very epocal, big transformation.

I would argue that four trends are most important. We're moving from an insular national economy to a more of an interdependent global economy. We are moving from a situation where we are very blessed with cheap and abundant natural resources to a situation where the natural resources are more expensive and there is a constricting supply in many areas. Petroleum is an example. Water is another. We also have a situation where there is a vast technological change as indicated by whatever you want to call this transformation, whether we are switching from an industrial economy to a post-industrial or a service or informational one. There is some sort of transformation going on even though we can differ a little bit about the labels and the exact numbers. And then, last, we are going through demographic changes in the labor market such as the role of women, of minorities, changing educational attainments, and those jobs that are out there in terms of college graduates graduating but not having the jobs out there that are commensurate with those skills. There is a great dynamism for good or ill that's going on and there is the need for new types of jobs, new types of skills and we are going to see more of that in the future rather than less.

How does one deal with this sort of problem? The traditional sort of tools that people have talked about in the past for dealing with job generation have always been more of a macroeconomic sort, fiscal and monetary policy. I would argue that these tools are exceedingly important and that part of the decline or relative decline of our basic industries is due to exchange rates and just depressed world demand. You only have to look at the figures for the level of demand from Mexico and other countries to realize what a falling off it has been in the last few years and how stagnant the world economy is. When you talk about a situation in this country, where the markets for old fashioned consumer durables like refrigerators is saturated, unless we are selling those abroad, these industries face a big problem. Nobody is going to be buying two, three or four ice boxes, but, again, there might be great potential for such durables in the larger world.

Well, at any rate, macro-economic policy, of course, is very, very important and I'm not diminishing it's importance, but I would still also argue that it's not enough. There are limitations. In fact the limitations have been, I think, shared by both conservatives and liberals in many ways. Not all of them, but a number of them.

They tend to assume that, micro-economically—at the level of the firm and consumer, everything is going great and is efficient, and if we just adjust the aggregates, everything would be fine. Despite its label, even supply side economics, which you would think

is more oriented toward the supply side of things, shares this analysis. It exclusively focuses on the level of public spending, rather than the types of public spending, and it looks at the role between the public and private sectors, in a real unsubtle way. Here, I think it's not that much different from Keynesianism.

So, basically, what I would argue is that there is increasing importance for sectoral oriented policies but also for non-sectoral generalized policies that are aimed at markets, that are aimed at market failures. Markets are like any other human institution out in the world. They are inhabited by people and nothing works perfectly. And even though the textbooks says markets are perfect or should be perfect and capital markets are the most perfect of all markets, etc. That's true only relatively. They are not like in the textbooks.

We could go through a whole series of different types of evidence and different types of theories and studies documenting problems in the area of patient capital equity and debt capital. New, young, and small firms have some problems getting the type of capital in the right form even though they can be job generating and technologically innovative. They face barriers accessing that sort of capital. Also there are a whole series of market failures, that we frequently talk about, having to do with research and development. Why it's rational for certain firms to underinvest in basic research and applied research. It's a sort of free rider situation. Everybody can benefit from it.

There are labor market problems having to do with information costs. Nobody is perfectly clear about what sort of profession they should go into in terms of what's the best benefit for investing their money in terms of education and training. There are all sorts of other perversions being created by some income maintenance programs. And there is the lack of access to capital to go to school for certain classes of individuals.

I would argue that the Government has a role in dealing with these sort of imperfections. This is again not to argue that, by diminishing these in their intensity, you are going to solve all these problems, or that you are going to create all the industries that you are going to require. But, again, if we don't make progress in this area, we are going to have some problems. I would also argue that this is an underlying theme under entrepreneurship policy and we must find someway, if we are going to have a vital and dynamic economy, of insuring that an individual, whatever his or her background, who has an idea on how to do something better has the access to the tools they need to take that idea to the market place.

This I think is very, very important. Entrepreneurship is also very significant for the economy. The job generation studies done by Brookings, GAO's research on the role of technology innovation and product development, and the research being done on bigger corporations and the importance of intracorporate entrepreneurship, as illustrated by "In Search of Excellence," are all good illustrations. So are the corporate culture movements that are going on that Mr. Forrester alluded to.

I also would argue another thing. When I am talking about entrepreneurship, I am not talking only about chip wizards or the

sort of individual heroic, white middle class entrepreneur. I am also talking about other people. I am talking about women and minorities as well.

There is a whole range of opportunities that I think government can try to encourage and provide some of the right tools that can enable people to get into business. And there is also evidence from a lot of studies on entrepreneurship on the origins of the entrepreneurs. A lot of times they are people that have no other way out or they don't work for anybody because they have become sick of it.

So an entrepreneur is not just the person who has an MIT engineering degree and a Stanford MBA, who is the ideal type of entrepreneur; there is entrepreneurial potential throughout the society, if the tools are available.

The next series of points I want to make concern the usual criticisms of this sort of approach. In other words, what are the limits of an entrepreneurial policy?

I think there are important criticisms and questions that people ask, but I think they are answerable in various ways. People argue, first of all, that small businesses create lousy jobs. Well, in a sense, when we aggregate statistics that is true.

But first of all, we are also talking about some businesses that can grow past a certain threshold and can afford the better wage and benefit packages. Second, there are also increasing evidence that even in the larger business sectors there are increasing numbers of poor jobs being created.

Also, right now, unfortunately, we don't know how to create more good jobs. We have some ideas—like employee ownership where people are participating in the wealth of the firm, as well as getting a wage. That could help out some. There are issues having to do with other forms of benefit structures. There are also strategies having to do with labor management committees and the quality of work life experiments.

I think we need to do more research and more work on this subject. But it is not a problem that is solely restricted to smaller entrepreneurial firms.

The second point is that small businesses go out of business so frequently. Well, again, there are statistics that support that, but there is also a difference between different types of failures. Sometime the failure is due with losses to creditors; some don't. Actually it is a smaller fraction.

Second, even a small business loss is not an insurmountable loss. There are all sorts of countless examples of people like Henry Ford who had failures to begin with, and people learn by their mistakes. So I think that is an important point.

Also, there is the quantitative evidence about the importance of business formation, the difference between the growth rates of the West versus the South versus the Northeast is not in the rate of job loss, but it is the rate of job formation and enterprise formation.

Again, the data are clouded by the importance of larger branch plants relocating and creating new jobs in some of these areas, but it also indicates that new enterprise development is incredibly important in terms of job generation.

There is also the problem of our older industries. What about this?

Again, the kind of changes we need to go through, and in fact we are going to go through to some extent no matter what we do, is that it will be hard on older industries; it will be hard on older communities and older workers as well. We have to deal with this.

The other side, I would argue, of an entrepreneurial policy in a dynamic economy is dealing with the social costs of development and of trying to find ways that we can retrain people and that we can have a whole series of other job search and other programs. I think the Job Training Partnership Act, title III, is a good example of this approach. It is something we need more of and could be refined.

We also need more entrepreneurial creativity in our bigger firms as well, and again, like Mr. Forrester was alluding to, there is a movement afoot within corporate America to think anew about this whole issue of entrepreneurship and management. And we can talk afterwards about some recent articles in executive magazines about this issue. It's under the label of "intrapreneurship," which is a term kicked around in the Economist magazine and other places to describe this new sort of concern about big business becoming more entrepreneurial.

So, it is true that we need to deal with these sort of problems of a changing economy. But, again, this doesn't throw out the whole idea that we need some sort of better entrepreneurial support mechanisms.

Well, what are the guidelines for such a policy? I would argue that there are six guidelines for such a policy.

I will just note the big policy areas, and I will close with a few other remarks. Then we can turn it over to Mr. Freeman.

First, an effective entrepreneurial policy has to have six dimensions, if it is going to make a difference and if it is not going to be just a marginal activity.

The first point is it must be carefully targeted. It must be targeted at those barriers to entry and expansion that face the young, small, and new and growing enterprises. Again, you don't give a tax incentive to a firm that has no tax liability and that is growing and at a certain stage of its life cycle.

The second point is that any sort of policy we need to talk about has to be—if it is going to be of the magnitude of the problem—in a sense indirect or systemic because it is not going to have the ability to cut deals with millions or thousands of entrepreneurs. There has to be some way of moving vast amounts of money in a certain way.

Third, it has to be the magnitude of the problem, capable of creating tens of thousands of enterprises and hundreds of thousands of jobs. Those are the magnitudes we need to talk about, not just in the traditional sense of the small business, SBA type program.

Fourth, it must be cheap or as cheap as possible because of the problems we are facing on the State, local, and Federal levels in terms of fiscal constraints. We somehow must rely as much as possible on either redirecting existing public investment flows or existing private ones, and I think again you can make a case that a lot of this money is not being invested wisely. In a sense it is being expended, not invested.

Fifth, any sort of approach must be market sensitive. I want to underline both the "market" and the "sensitive." It is not presuming that markets work perfectly. Also, it is not wanting to engage in tapping the market of a lot of people.

It is not going to presume markets are perfect, and it is going to try to move a lot of money in a market-oriented fashion.

Last, it must be comprehensive, of course. There is a range of policies from income maintenance policies to training policies to traditional economic development policies that are all important, which again means it is not going to be done overnight.

The other kind of caveats about such a policy that I think are important are that any sort of approach to this thing would need to get rid of a lot of the old ideological baggage about labels regarding public and private, and conservative and liberal. There is a lot of mythology, I think, about both the public sector being always inefficient and the private sector being always efficient that I think we need to get rid of.

I think we live in an economy where both public and private have their role to play, and we need to find new ways in a nonideological way and an empirically sound way of getting them to work more efficiently together, which also means to look at a lot of our government spending—not so much spending as investment. Are we investing this money wisely in our infrastructure, in our training, in our education, in our firms and in new ideas or are we just throwing the money away?

So, those will be the guidelines of such a policy.

I will close with making a few more remarks about some of the areas that I think are incredibly important and then say a couple of quick things about a piece of legislation that I think is one tiny little step in this area, although there's other examples of legislation being sponsored by numerous Members of Congress that I think are also important and we can talk about as well.

First, I think any entrepreneurial policy would have an eight-point program.

One is the whole issue of stimulating seed and equity investment in new and young firms and long-term fixed rate debt for growing firms. There are a number of ways we need to think about doing that, from fiddling around with the Tax Code to looking at regulations, not in the traditional sort of conservative way of looking at regulations but having to do with banking regulations, pension fund regulations, other areas like that, that make these institutions more risk averse than they should be.

Second, we need to be thinking more about gearing our training and education system toward ways with stronger built-in job creating or job securing sort of elements. I would argue that, despite all the attention that we are always putting on training, training is not a be-all, end-all. There is a lot of evidence that indicates that it is not going to solve all our problems. If there are no jobs out there, training is not going to help. So we need to find some way to link up job generation with training more closely.

There are ways that some States and localities are already experimenting. To take one little example, having to do with entrepreneurial training, rather than just simply training them to be a new job taker, training them to be a job maker. Consider the situa-

tion out in Youngstown, OH. There is a guy there who is very alienated, to put it mildly, about losing his job. He doesn't want to go through a retraining program in any traditional way. He may have a set of hobbies or skills that would enable him to go into business.

That might be an option that we might want to think about with our kind of human capital programs. We need also to be thinking about how to use economic adjustment programs, not just to train people or cushion the blow but to find some ways to encourage entrepreneurial energies in terms of our traditional firms and to assist communities to have more proactive strategies to preserve and create jobs.

We need to deal with our income maintenance programs in such a way that they not only mitigate the pain of dependency, but also support and encourage training and work in job creation. There are some existing ways we could talk about that. And we need to be gearing our research and development more toward commercialization.

We need to be building up a lot more entrepreneurial and managerial skills within the public sector as well as the private sector. Both, I think, are important in terms of the experimentation that is going on with different kinds of development banks, which I think have an important role in financing particular market niches.

Last, we need to give increasing attention to the issue of job quality. I don't have any big answers about that, but that is something that we need to be mindful of.

So, I will close with remarks about a piece of legislation I have done a little bit of work on that I think fits the bill on some of these areas. It doesn't do everything. It only does a few things.

Anything we are going to need to do in this area is going to take a decade or more. There has been a piece of legislation that has been recently introduced by Congressman Schumer from New York, the National Entrepreneurship Financing Act, H.R. 4718, which is a four-title piece of legislation, which would set up a secondary market for industrial mortgages and provide a means of investing matching money in State development finance vehicles similar to the Connecticut Development Corporation. It also sets up a matching grant fund for States to set up clearinghouses for pension funds to try and match investors and entrepreneurs. It also proposes a national loan-loss reserve fund, which is an actuarially based insurance funds for insuring more entrepreneurial deal making by banks.

So, in closing, there is a lot of work that needs to be done. We need to give increasing attention to the issue of development, dynamism, and the economy of entrepreneurship. And Federal, State, and local governments need to invest more money in this area.

If we find ways to do this in a creative and effective way, we are going to be generating hundreds of thousands of jobs and tens of thousands of enterprises, which will really take a notch out of the unemployment problem. I think after the recovery takes hold, even a little bit longer down the road, we are going to still have immense problems in terms of job creation.

Thank you very much.

Representative LUNGREN. Mr. Freeman.

REMARKS OF ORVILLE FREEMAN, CHAIRMAN, BUSINESS INTERNATIONAL CORP.

Mr. FREEMAN. Thank you very much and good afternoon, ladies and gentlemen.

I am reminded a little bit at this stage—some of us have been here now for 2½ hours—of the old adage that Adlai Stevenson used to give sometimes when we were out on the campaign stump a number of years ago. He said that the mind can absorb only about as much as the seat can tolerate. I hope your sitter is in good shape.

I do have a thing or two to say, and I hope they will be relevant.

U.S. companies, as they look out beyond their borders for new markets that will help sustain their home base of operations face a far different world from that which lay before them at the end of World War II. At that time, U.S. business was feeling the overwielding industrial muscle that helped it win a two-front war. Europe was in ruins. Japan and Germany, former industrial powerhouses, were vanquished enemies. Simply put, the rest of the industrialized world, while expected to come along rapidly, was not yet ready to compete.

Other factors favored U.S. companies in that early period in the 1950's and 1960's, which by way of comparison helps us, I think, to understand today. The overseas markets were plentiful. All the ravaged countries were reaching out for infusions of capital goods, equipment, consumer durables, nondurables, et al. Most of the developing countries were full of money, flush with earnings, eager to spend it on goods and services.

Also, the world had seen a breakthrough in technology that was of eagerly awaited peacetime use and broad consumer application. Much of this technology was American in origin. What's more, there was a spirit of entrepreneurship among many of the millions of returning veterans—we will get to that in a moment—whose horizons had been widened beyond their hometowns and who felt they could meet any challenge in their quest for better lives for themselves and their families. That's entrepreneurship, I think.

The global environment was basically a stable one for doing business. The rules of international trade had been carved out under the aegis of GATT, and the process of reducing tariffs and other barriers to trade had already begun.

Too, the U.S. dollar reigned supreme in an orderly monetary system in which virtually every currency movement could be predicted. There were few surprises lurking in the realm of global finance. The forces that shaped the movement of capital and goods and governed competition among nations have very much changed. They do not favor U.S. companies as they once did. Economic growth, while at present in a state of recovery, is not expected to be sustained.

This will force governments to seek ways of isolating their economies from global stagnation. Barriers to imports continue to plague firms that dare ship goods across national borders. Interest rates are again climbing, to discourage capital expenditure on plant and

equipment that could underpin continued economic vitality. Unemployment persists, encouraging governments to adopt measures to restrain government budgets that lead to industrial policies that distort competitive advantages through heavy subsidies.

In order to be able to assess the ability of U.S. industry to compete, and the role government funding and policies can play in helping companies develop and use the technology necessary to sustain our world position, we must understand these new forces.

Below I have outlined a number of key considerations regarding the changing global environment that we should bear in mind during our discussions today.

U.S. companies are not alone in their concern for the changing and unstable rules of the game. The difficulties that policy and economic uncertainty bring affect all business, whether in Toledo, Turkey, or Turin. This was very much apparent in the conclusions which emerged this year from Business International's Chief Executive Officer Roundtable. This forum each year draws together top executives from among 150 companies based and doing business all over the world—and Professor Forrester participated in one such a dozen years ago—to discuss changes in the world environment that affect global business.

The concerns voiced by the group I believe can help shed light on what we are discussing here today. Let me share with you some of the consensus that emerged from their deliberations. And I quote:

> A key challenge facing the world today is how to integrate a global economy in which all elements are vastly interdependent and in which every policy, every remedial measure can lead to consequences beyond the realm of understanding of those making the decisions both in the government and in the private sector. Recognition of the need for worldwide policies and programs by national governments is unlikely to be significant or consistent enough to avoid more years of surprises and unpleasant difficulty.

Trouble is brewing. In the view of many top executives, the current U.S. budget deficit and high interest rates add up to the most serious world problem since World War II. The world's major challenges can only respond to transnational solutions. Unfortunately, many obstacles lie in the way, including nationalism. The principle of sovereign equality which gives each nation and many international institutions one vote, regardless of its size, is an issue in ideological differences. Thus far, nations are attacking the problem on a crisis-by-crisis basis without any effort to deal with root causes and the broad spectrum of related issues.

It is essential that the United States recognizes international responsibility and pursues a clear policy course consistently. U.S. business should call on the Reagan administration to place higher priority in reaching consensus among developed countries in order to help international institutions cope with problems, particularly in areas that affect companies such as trade and transfer of technology.

These observations by top businessmen from around the world have ramifications for our discussion. The implications are very simple. We must be extremely careful in what each of our nations strive to do alone. We must make every effort to coordinate our policies, lest we drag each other down.

We live in one economy, what one speaker at our congress called "world economy," one world economy, not only interdependent, but literally integrated.

In one respect, the current situation does have a point in common with the heady period of U.S. business at the end of World War II. Like before, we stand on the threshold of major advances in technology and its application to everyday life. Like before, the United States is very much at the vanguard of these new developments that are flowing from our universities, major corporations, and smaller sized innovative companies.

But unlike before, other nations are not as receptive as they once were to our technology. And the reason is very straightforward. These nations want to build their own industries and do not want to be beholden or vulnerable to U.S. industry.

Nowhere is this more apparent than in information technology, including computers and telecommunications. Information technogy is only one of several exciting areas of scientific advances. Another, as we have heard, is biotechnology, leading to breakthroughs in drugs, plants, agrochemicals, genetics, and even energy.

A third key one is the science of new materials, that continues to pump out new substances to be used in the electronics field. It will help reduce costs, increase capacity, and create new materials for use in buildings, vehicles, and aircraft, to name just a few applications.

We are going to have a forward-swept aircraft flying within this year, only because brand-new materials strong enough to sustain that pressure have been developed.

In all of these fields, the United States is in the lead, not only in the laboratory, but also in the application of this research and to substitute for older methods and materials and open the way to new areas of opportunity never even dreamed of before, but being made possible now through new technology.

Like in the postwar period, these developments could be the stimulus needed to lead to revitalized growth and to new industries that can replace mature operations, taking up some of the slack in the unemployment rolls.

But as I said, barriers are already being erected against the most advanced of these three areas mentioned; namely, information technology. The flow of computerized information across national boundaries, also known as TBDF, transborder data flow, increasingly is becoming a concern to U.S. multinational companies because it is so vital for wideflung operations. It is used to link parent with subsidiary, keep financial tabs on operations, ship orders, maintain inventory, design products via computer to the customer's specification and the like.

TBDF is also a source of growing business in itself, in the form of computer peripherals and software. Our industry is far in advance of others in hardware and software, making the field a natural one of expansion for our overseas business.

Unfortunately, the path to the application of TBDF is getting rougher internationally. One concern is the privacy of individuals and the fear that it might not be as protected as it is under domestic law if it's easily accessible via computer linkups to other countries. This worry has already led to restrictive laws in many coun-

tries in Europe. A Council of Europe Convention on Data Protection, which goes into effect sometime this year, would effectively freeze out data flow to the United States, which is not a signatory and, outside of the common data protection zone that is being created.

We in the United States are as protective of the privacy of the individual as are the other nations in question. But we do not have an omnibus law on privacy, but instead rely on numerous, less obvious pieces of law to protect individual privacy.

The privacy issue is but one of the many affecting U.S. information technology and its free flow abroad. Other countries are concerned for the development of their own information-related industries for both economic and security reasons.

Too many are trying to protect telecommunications, which is usually a government monopoly most everywhere in the world except here. To protect their nascent industries, both hardware and software, and their PTT's or telecommunication authorities, they are restricting our technology through manipulation of standards and restrictions on private telecommunications use.

These are adding to the costs and proving to be, at a minimum, a bureaucratic headache and, at worst, an effective barrier to trade.

New wrinkles are developing all the time. Let me give you a recent example. A systems analyst of a U.S. company who has been installing systems in several of her company's plants in Great Britain ran into difficulties with the U.K. customs officials. She had been bringing in system disks containing the appropriate software and declaring only the value of the encoded disk, about $250. But suddenly, customs officials decided to stop and ask for the actual value of the software, and levying a 15 percent value-added tax. This meant the entire software value including total development and programming costs, something she couldn't possibly know or have the thousands of dollars that it would cost to cover the tax.

They confiscated the disks for some days and finally resolved the issue by placing the tax on the corporate charge being charged to the U.K. plant by the U.S. parent. As you can see, transborder data flow can be full of surprises and constant barriers.

Such information flows and the means they use are but part of the growing picture of trade protectionism. As the heads of the world's leading nations gather in the summit meeting this week, protectionism remains a top item on the agenda, as it has in many previous such events. The issue will not easily go away as long as our trading partners have to worry about slow growth and unemployment prospects at home, and fear the protectionist pressures for the vital trade they do with the United States.

There are no "good guys versus bad guys" on trade barrier issues. We are all guilty of engaging in stalling. There are several implications for our discussions here today. First, the United States is in a command position in many technological areas. Let's not forget that. We do tend to put ourselves down too much on this score.

Second, we are in dire danger of being closed off from freely utilizing these technologies in other markets of the world, as can be seen in the experience on transborder data flow.

Third, as we formulate policy, we should keep in mind the tremendous potential of our technological lead, to make certain that we hang tough in international forums, to press for a freer flow of our technology where it doesn't compromise our own national security.

Let me add, stimulated by a previous speaker here. Bill Schweke and also Professor Forrester, another very significant force that has been largely ignored and that really is overwhelming as we try to evaluate where we are in our economy. That is, the extraordinary job-creating performance of the U.S. economy in the last 20 years. We have created new jobs at a faster rate than the smokestack industries are losing them, at a rate unprecedented in our peacetime history. There has been an increase of jobs of almost 50 percent since 1965, more than one-half of them since 1973, the years of the oil shocks, the two recessions, and the near collapse of smokestack industries.

In the last 10 years, Japan has had a 10 percent growth of jobs, only one-half of the U.S. increase of jobs. And Europe has had an actual shrinkage.

This increase did not come from government. It did not come from big business. Instead, the jobs came from medium and small businesses. I think the kind of entrepreneurship that we heard our previous speaker talk about, the shift to entrepreneurial and innovative businesses—and they have been mostly no-technology or low-technology—if there is a new technology, it's management. And the new spirit is one of entrepreneurship and a willingness to go out and submit to the discipline of investment in hard work, to go out and drive for a good result at the end.

I would say to Professor Forrester that I question the long wave theory as it applies to the United States, in all due respect, in light of this incredible performance, which no one can quite explain. The best explanation I think is the one that I have given, and that I do think needs to be more adequately understood and more adequately examined. And perhaps we poor-mouth ourselves a bit too much looking toward the future. There is a dynamic here which Europe doesn't have, which Japan doesn't have. Perhaps the long wave theory may apply there, but I would question whether it applies here.

Commenting just a bit on the private sector and the fact that it is adjusting. Let me just say that far too often legislators and government officials around the world, in their haste to guard their nation's interests, look for ways to help protect their industries without realizing how much business can and does do for itself to meet changing conditions in comparative advantage and in competition. Certainly, companies often do ask for import protection and for rules that give them the edge in the home market. But most executives recognize that the only way to stay permanently in the game is to adjust themselves to new circumstances.

Let's look at the case of the Germans. Turn outside our country for a moment. The machinery sector. Over the last 3 years, the German machinery section has seen both its domestic and foreign sales drop.

Last year, for example, it experienced a serious fall-off in shipments to the United States, its number two market, despite favor-

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able exchange rates. Economic recovery is currently helping the industry, but many German managers are quick to concede their share of strategic mistakes and are not just depending on the current economic upturn. The industry is making hard choices.

I'm going to skip a couple pages in my paper here in the interest of time.[1] You can read them if you wish.

There are a number of other examples chosen on purpose from outside the United States. There are plenty of cases closer to home of adjustment by companies that are growing, demonstrating entrepreneurship.

The ones I want to make are (1) everyone's groping to get back into the competitive game, often on fair terms of successful business practice, (2) excessive tampering with the process could distort markets, and (3) there is an enormous market for U.S. know-how and technology, if only it can operate unfettered.

Many signs are pointing to a changing international trade that may derail the modernization process in developing countries and change our perceptions of where future wealth will be created.

There's been a theory of production sharing. Given the demographics we heard today, it's inevitable that everything labor-intensive is going to move to the developing countries, simply because there aren't going to be bodies to produce in the developed world. Soon we're going to see, starting about 1990 or even quicker, zero growth in the 20 to 40 year productive age range in the industrial countries, and completely exploding growth, something--don't hold me exactly to this number—in the nature of 600 million in developing countries.

So the point that's been made by many economic philosophers is that industry is going to have to move to where those bodies are. That's easier to do than it is to move the bodies to the industry.

Well, now, new technology is beginning to question that, because there are a good many companies who find that using modern technology, using robotics and whatever, they can produce as efficiently at home. The comparative advantage of inexpensive labor may no longer apply if that's the case. I don't think it's completely the case, because technology and robotics are not going to come into practice that quickly. However, this is a new force and one that can be extremely troublesome on the world scene, as became clear here today. I won't go into this in any detail but I'll be happy to comment later. This enormous population explosion, particularly among the young in the developing countries around the world and the unemployment that goes with it is astronomical. And at the moment, it seems almost unsolvable.

I think it's outside of the "Big Bomb," the world's number one problem. As someone with a little exposure in agriculture, I think we are seeing increasing evidence of labor-intensive, not only capital-intensive applications in agriculture reaching out to small agriculture producers. I've observed that since the years I was Secretary of Agriculture. But the extent and the magnitude of this movement and whether it will move fast enough remains to be seen. Actually, the green revolution, on balance, did not displace workers and farmers and farm laborers. Instead it created jobs for

[1] See appendix for Mr. Freeman's paper.

more of them, because if you're going to triple-crop and use high technology, it requires great care and intensity and that takes human labor. And in many developing countries around the world, in the rural areas, instead of having a labor abundance, you now have a labor shortage.

If you're going to move three crops a year, you have to dry them and store them and market them. It takes a lot of labor. A lot of it is having to be done by small machinery in many of the developing countries.

Technology now makes it possible to reduce the labor content, as I say, of these former labor-intensive operations. The same is true for services. At one point labor-intensive services were thought to be shifting to the LDC's. For example, software to India, which has a tremendous availability of trained and skilled people; however, as the cost of services are driven down, the companies are finding less reason for transferring them to low labor cost centers abroad.

Other areas vital to the development of LDC's are also suffering from technological advance. More R&D should be performed locally is a constant claim in developing countries around the world. But companies have found that cost efficiencies dictate that much of their research be done centrally. Even local adaptation of products and design changes are being centralized since computer to computer links allow changes in specifications to be done back home.

I brought up the above points because of the effect it will have on developing countries and global trading patterns. The transfer of many operations to sites in the developed world will affect the ability in developing countries to generate the wealth they need to assure social stability among their growing populations. It is also the same wealth that generates good business for exports of finished goods and components from the United States, Europe, and Japan. The hopes of many of the more advanced of these developing countries has been to export into the developed world many of the products that may not be competitive with plants in the industrialized countries. Such changes in trade patterns will have repercussions on the ability of the LDC's to retire foreign debts—which you heard about today—with export income. It means only that those with a significant industrial base and an extractive industry prospects can hope to do as they had earlier planned.

A quick comment on changing forms of doing business. When U.S. companies began to develop their overseas business in earnest 30 years ago, they started with export operations run through distributors. Then they moved on to branch operations, followed by wholly owned subsidiaries, many of which later took on local equity and joint venture partners. The forms of doing business abroad are evolving rapidly. The more they change, the more they remain the same, but with new twists.

Let me explain. Take exports. It no longer is a matter of exporting goods and getting paid for them. An increasing number of countries, some 80 at least, now require some form of counter trade, in partial or full payment for goods received. Estimates on how much of the world trade has been demonetarized, in a sense, varies from a low of around 8 percent to as high as 30 percent. The practice has reached far beyond the Eastern Bloc countries where

such ideas as buying items from the plant and equipment sold to them have reached high degrees of intricacy and sophistication.

Countertrade has many implications for world trade. For one, companies must be in a position to accept or even guide the terms of such trade or their competitors will capture these markets. For another, the practice raises all forms of issues for governments such as ours regarding the financing of such trade, acceptance of such compensatory trade at one's borders, and so forth. A third point, countertrade plays havoc with third country markets, where products accepted in countertrade deals often wind up at a discounted price in competition with similar products coming in through ordinary channels.

On another scale, U.S.-based companies are willing to live with less equity control and investment in their overseas ventures. Nonequity relationships with companies that are closely related through former ownership—we had a little bit about this earlier day—and control presents all forms of difficulties, not only for the parent executive but also for governments like our own that often try to apply laws within extraterritorial reach.

Companies are also starting to form cooperative ventures different from the traditional joint venture. These new forms of joint enterprise grow out of coinciding interests and are not joint ventures in the traditional sense of having shares and a mandate of their own. For example, in Germany, one toolmaker company has been sharing services and maintenance with two electronic firms. As a top executive at the tool firm put it, their control systems supply our service technicians, and they know our machines well enough to be of use when necessary, just as our technicians are familiar with their control system maintenance. Some of the deals put together by Toyota and General Motors and Inland Steel, and various Japanese steel companies are really cooperative agreements. They are not joint ventures. There is a whole new development taking place along these lines.

Another important way in which overseas business is changing is in the size of operations of the new players. Many new technological developments are coming out of small and medium-sized companies in the United States and elsewhere, and many of these are following the business dream pioneered earlier by their bigger counterparts when they first started international business. The smaller operations appear less threatening to overseas host countries and they are good conduits for needed high technology. As a side note, many big companies are moving toward working with these smaller firms. Some contract out parts of their business while they concentrate on what they do best.

Professor Forrester said this today. It adds up to coordination and development of markets and sources of supply. This phenomenon of smaller, highly integrated companies venturing abroad has important implications for U.S. policy. Such firms may be the thrust we require in exports, provided they're helped along in various stages, from R&D to trade financing and facilitation. The trend toward cooperative ventures also requires study and policy ventures.

Finally, state-owned enterprises, SOE's, which engage in direct industrial and manufacturing activities, are a difficult phenomenon

for a private sector firm to contend with when operating abroad. Until very recently, the trend was to create more state-owned enterprises. Tight government budgets and looming deficits are convincing countries that have them to cut back on the SOE's in their stables. France, Brazil, and Mexico are all in the process of selling off some of these industrial holdings, placing them back in the private sector. But few countries are actually abandoning the SOE concept. Instead they're dieting, fine-tuning their appetites to hang onto the most nourishing of such holdings.

Why are these enterprises a wild card in international trade? Several reasons. The absence of pressure to earn a profit means they can expand into overseas markets, even with a poor profit prospect. Their chief concern is to preserve jobs at home, that is, maintain employment even at the low-level costs of operating. They have preferential access to government financing which allows them to charge lower prices than competitors at home and in third countries. They have built-in markets, in that government agents are per force required to purchase from them.

In several ways the state operated enterprise is an effective instrument of economic nationalization and protectionism. It can be made to keep investment at home, forced to buy from local suppliers, hire a workforce in excess of true needs. The SOE carries out national industrial policy, unquestioningly. In some ways SOE's are a way around reductions made in tariff and nontariff barriers under the Kennedy and Tokyo Rounds of the multilateral trade negotiations. Their existence allows governments to restrict imports via practice, not open fiat; to subsidize export operations without appearing to be doing so through such banned instruments as tax rebates, and the like.

Any policy deliberation by the U.S. regarding facilitation of R&D to help the smaller business venturing overseas, that is, evaluation of our industry's relative competitiveness, should not overlook the state-owned enterprise phenomenon.

In summary and conclusion, permit me to identify at the close of my paper—based on Business International's close working and reporting relationship with 300 major multinational companies operating all over the world—principal causes for corporate changes taking place in doing business around the world. Time is short so I will not deliver them now but they can be found in the record of these proceedings.[1]

Thank you very much.

Representative LUNGREN. Thank you, Mr. Freeman.

The time now is for some reactions and response, and I call on Congressman Lundine for any remarks he might have.

Representative LUNDINE. Well, I would just as soon keep my remarks very brief. I don't know if there is time for an open dialogue here or not, but I'd like to say, first of all, with regard to Mr. Schweke's presentation, that I certainly agree with his diagnosis or basic diagnosis. I'm not so sure about the prescription, but then again, he didn't sound so sure about the prescription. [Laughter.]

I think the issue you raised without suggesting that you had the answer is really the key question. And that is, quality of life. If we

[1] See appendix for Mr. Freeman's paper.

can't improve our standard of living, that is really what it is all about.

It seems to me that we have to have some kind of a strategy in mind to do two things. One is to make the transition as effectively as we can into producing more high-value-added products regardless of industry. I personally think that the widely held notion that there are high-tech firms and then there are basic-industry firms is silly and is a false dichotomy.

I am not as disturbed as a lot of people are. If the test of an Atari Democrat is if you're appalled about the transfer of the Atari jobs to, what was it, Taiwan, that is not surprising to me: Their low wage, their low skill. And I just don't think you're likely to retain low-skill, low-wage jobs in this country.

What we really have got to try to do—and I mean public, private, as well—is to have a strategy toward higher-value-added products.

Second, it does seem to me that we have to try to foster a culture that makes jobs rewarding, not only financially. We touched on employee ownership. When only 7 percent of the people have a real stake in terms of stock ownership in this economy, it is somewhat troubling. When 2 percent of the people own 50 percent of all the equity in American corporations, that's a major concern. And I think we have to pay some attention to that.

Certainly, Senator Long has come up with every tax break you can think of. The well may be dry there. I don't know. But it isn't just reward, it's also I think the quality of jobs. I mean if we were only in it for financial rewards, I would think that both my colleagues could achieve a higher level of success than they have. I won't comment on myself. In other words, there has to be something, some excitement to this job of being a Congressperson that keeps you at it other than the pay rate.

And I suggest that that is just as true for a machine tool operator as it is for Members of Congress. And I think that the whole notion of quality in terms of product and quality in terms of the working environment is companion to the strategy of getting the more high-value-added products into smoothing the transitions.

I don't care if it's steel, automobiles or parts thereof, or if it's fiber optics or microbiology. I think we're going to have the jobs that require the higher skills or else we're going to continue to stagnate.

That leads me to Mr. Freeman's remarks. And I think there is something fundamental, the basic economic assumptions that you have made. And I think the Japanese have proven it. Others have followed. That is that the comparative advantage that he referenced is somehow God-given. Comparative advantage can be changed, and you can do it through some of the techniques and environments that our competition in Japan have used. In other words, it isn't as fundamental economics would have us think: Who is closer to natural resources and those kinds of things. To some degree it is. How successfully you can work together both at the workplace and in terms of a national strategy.

Now the phenomenon that Mr. Freeman mentioned about the increase in jobs, I have to take a little bit of issue with. The fundamental reason why we have increased jobs so much compared to

Japan particularly, Europe to some degree, is that we have not been increasing our productivity as fast.

Now, it is truly a miracle that we have absorbed as many people into the work force as we have. But the fact of the matter is that the other industrial countries, not only market shares of industrial product, but their standards of living, has been rising faster than ours have. The reason for that is no great secret. It is that the growth in productivity has been substantially slower here than it has in these competing countries.

I think it is a serious long-term problem and one that seems to have turned around now to some degree in this recovery. But I worry a great deal about it because this recovery seems to me to be a consumer-driven one rather than an investment-driven one, which all of who buy even a portion of supply-side economics believe that it would be.

In conclusion, I thought Mr. Freeman's comments about state-owned enterprises and his warning were something very futuristic as would be appropriate in this kind of a forum because I don't much believe in state-owned enterprises, but they do create phenomena that are difficult to address by our existing rules of international trade.

In fact, I think our rules are totally out of date, even disregarding the next looming big trade question, or nation that's going to raise trade questions, the People's Republic of China. And if you think you can figure out what is a subsidy or what is dumping when the Chinese really begin to produce, then you're a whole lot smarter than I am. I think we're going to get into a new era where proving what is an unfair trade practice is going to make the present dilemma of how to figure out what the subsidy in terms of protection of their domestic market plus research and development plus having no antitrust that the Japanese maybe give to some of their industries, easy by comparison.

So I do think that as important as GATT might be in that framework of trade we developed, we are entering a new era not only in the ways that have been brought out in terms of transition, but a new era in trying to figure out what are reasonable rules that should apply. And I think his warning about state-owned enterprises is one important aspect of it.

Mr. FREEMAN. May I just respond, Congressman, for the record here on the new-jobs thing. These new jobs have not come in manufacturing or large industry where you have directed your comments concerning productivity to meeting competition. I repeat again, they come almost entirely from new medium and small enterprises, and not in the smokestack industries, where we have been losing jobs. We have been paring jobs, not increasing them there.

I mentioned this, in my findings. I hope you will check it. If I am right, we ought to take a look at what is causing this great job increase rather than poor-mouth ourselves so much about jobs. Women's employment has exploded in this country. Now how did we do this? And what does it mean for the future. So far we have paid little attention to this remarkable phenomena.

As I say, it's a highly significant thing. Europe during this same period has lost jobs. Japan has increased jobs only half as fast as we have, and it has not been in the smokestack industries.

Representative LUNDINE. Just to respond—I don't want to turn this into a dialogue—but my view is that we're not going to drift off into high-tech heaven, and there is no such thing as a post-industrial economy, in my opinion. If you don't make anything, you're not likely to be the consultant to the world, and if you don't build anything, you're not likely to be the architects and engineers to the world.

Mark Twain said it almost a century ago, that we can't all make out by taking in each other's wash. Somebody has to make something. And as long as our productivity in manufacturing, let's say, is not improving, then I think we are going to suffer, as we have, a relative stagnation in the improvement of our standards of living.

Representative LUNGREN. Congresswoman Schneider, your reaction and comment.

Representative SCHNEIDER. I regret that I was unable to be here for Mr. Schweke's comments. But as a result, I would like to pick up on some of Mr. Freeman's remarks and also Congressman Lundine's.

Mr. Freeman, I was getting a little frustrated because as a Member of Congress I am very action-oriented, and as a person I am always looking for solutions. And I will say that you did an outstanding job in identifying the problems and clearly articulating the complexity. But I felt rather frustrated in that I didn't feel that there was any great offer of solutions there. And you made the remark something to the effect, how are we going to integrate our global interdependent economy. You mentioned that we lack the capability of changing the course of events, which is a very pessimistic, negative kind of outlook.

You also touched on the point of our nationalism and ideology. I am in agreement with you to some degree that it does seem rather frustrating when we are dealing with issues, for example, of protectionism and there is a mentality that seems to disregard the realism of our world economy and our interrelated nature, and we make decisions that are far more parochial. Some of us know that it's not in the best interests of our country overall.

But we see this kind of mentality to be a constant among a certain generation. Now, I say this with all due respect, recognizing that we have some age differentials here. But as a Member of Congress I have noticed that, a mere observation, some of the more senior Members of Congress have a tendency to think in World War II frameworks, that if you're talking about the defense budget there will be a tendency to think, "Well, we need X number of this weapons system to match X number of that weapons system held by the Soviets," meaning that during World War II days we might have said, "Well, we need 500 tanks if they need 500 tanks."

But we're talking in a different framework now. We should not be comparing apples with apples; we need to compare apples with all the other kinds of fruits. Maybe my analogy is getting too broad.

But that leads me back into thinking that unless we can educate the public through the media into recognizing our interdependence

and educate the Members of Congress to understand our reliance on other nations, how are we as a nation going to move ahead?

Mr. FREEMAN. Well, we have to do that. And it is extremely difficult.

Representative SCHNEIDER. How?

Mr. FREEMAN. Continually banging away at it, talking about it. You're out on the stump all the time as a Congresswoman. Go for it. And when a tough decision comes up on one of these that you have to make, why, lay it on the line.

This is very necessary. Our people don't really understand what is taking place in the world.

I have run for statewide political office six times. I know what it is to take on complicated global issues. You don't take them on unless you have to, but sometimes they come up and you have to meet them head on. To do this is critical—tough responsibility of a democratically elected official—in defense of my generation. [Laughter.] May I say that the greatest period of constructive internationalism, in what we do have today by way of international institutions, were built at the immediate end of World War II: GATT, IMF, World Bank, the whole business. And we have done nothing really meaningful in the world to build real international institutions since that period.

Of course, it was much easier then. We ran the show. We were Mr. Big. We told the world what to do. But it's a good record. We can be very proud of what we did to rebuild the world. The trouble is we built them up and now they are competitors. It was a heck of a lot easier to lead and tell them what to do than it is to have to compete with them. That's one of the reasons for the recent use of nationalism.

Representative SCHNEIDER. That leads me into the second point that I wanted to make. The United States after World War II, which I think is a significant turning point, not only in the United States but in the global environment, has taken on the posture of very strong nationalism: "We the United States are number one." And as a result of that kind of attitude, which is all pervasive in this country, there is a lack of willingness to reach agreements with our trading partners and to work as a team in many circumstances.

Now, you made the point that the United States is in a command position to do something about protectionism. Can I assume that means to set an example? And if that is the case, why haven't we done that with some of our closer allies like Canada?

Mr. FREEMAN. I think by and large we've done very well with Canada, the automobile agreement and a number of others.

Representative SCHNEIDER. We have the potatoes.

Mr. FREEMAN. I didn't say a command position on protectionism. I said a command position on technology.

Representative SCHNEIDER. I thought you meant a command position of leadership and changing the global perception of nationalism.

Mr. FREEMAN. I don't think I used the word "command." But I think we are in the position as the leader of the free world to carry the major responsibility. And some of the restrictions on imports

we have been imposing aren't quite meeting that standard, in my judgment.

Representative SCHNEIDER. Needless to say, that's an area where whether we're talking about world peace or whether we're talking about international exchanges, there needs to be a greater reliance on communications with our allies. And that doesn't seem possible when each country is saying, "Our country is best," or "We are the smartest or the best and the brightest," or whatever. We're not willing to stoop as often as interpreted to deal with other allies and work as a team. There is a singular kind of mentality that prevents us from teamwork, cooperation. And that is very frustrating. That is how I see one of the barriers to our improving this global exchange, global mentality.

The other point that I just wanted to touch on was your reference to overpopulation. What do we do with that situation in the lesser developed countries? I had the opportunity under the auspices of the United Nations to represent the U.S. Government at a conference on women and their future in the Caribbean. And it was interesting. All of the women there, the women in government, were saying, "How are we going to reduce our increasing populations?"

They wanted to solve that problem. They recognized that because of overpopulation, it was holding their countries back from increasing productivity and becoming competitive. And one of the points that was made was that of education, that it is a societal form of education that must take place to inform women and men that there is more to a woman's life than making babies.

It is a cultural educational process that has to take place. And until that does happen, we will continue to see women in the lesser developed countries realizing their role as only baby-makers. And that certainly should send a pretty strong signal to the U.S. policymakers that if we are going to attempt to help the lesser developed countries, then perhaps our emphasis should be on education and perhaps less on some of the other areas where we are, I think, expending a great many dollars.

Mr. FREEMAN. I agree with that. But you also probably know that 80 percent of the farming in the world is done by women.

Representative SCHNEIDER. Yes. Absolutely.

Representative LUNGREN. Reaction and comments from Mr. Monroe Karmin.

Mr. KARMIN. I have two questions for Mr. Freeman, please.

You drew a contrast between the stability of the world financial situation after World War II and the volatility of today. Does that imply a dissatisfaction with today's floating exchange rates? Just what would you suggest we do about that?

Mr. FREEMAN. I don't think we can do much about it. The magnitude of the movement of money around the world is reaching tens of billions of dollars within hours, in response to a whole host of forces has created major uncertainty. Everyone thought that there would be a reflection of underlying economic conditions when exchange rates were permitted to float. Maybe so in the very long run. But it may take several years, far to long, for that to happen.

Many have been saying for quite sometime, "How can we possibly still have such a strong dollar?" But few think it is possible to

go back to fixed exchange rates. I think that's impossible. But it's one of the problems we do the best we can. As the Fed has said we operate on the margins when there are severe short term savings. This administration has said from time to time now, "When there are extreme and erratic swings, we will intervene. That's all we can do."

But in money matters, companies and individual investors handling money are hedging and using all kinds of techniques trying to protect their money around the world. It all adds up to a situation of great uncertainty. And I really don't think, outside of the margins, there is really much any one can do about it.

Mr. KARMIN. And you see no need for reopening the gold window or some monetary backing?

Mr. FREEMAN. No. I think that's impossible. I think doing so would adversely curtail currency fluidity. Fixed rates of exchange are no longer workable.

Mr. KARMIN. My other question is, you stated very eloquently the role that small and medium-sized businesses have played in creating the new jobs in America to replace those being eliminated in the smokestack sector. My question is, why do we need a national entrepreneurship policy at all if they're doing the job?

Mr. FREEMAN. I think I better defer that to my colleagues here.

Mr. KARMIN. Do you agree? I misstated it. Do you see any reason to have a national entrepreneurship policy?

Mr. FREEMAN. Frankly, I do not. It seems to me that certain national policies should be carried out that would help. Research is one; access to training is another. So far job creation results through entrepreneurship have been extraordinary. There seems to be this new spirit of entrepreneurship about the land that is all gung-ho.

So as I said, in my formal remarks about the Government getting involved in the economy, go about it carefully and slowly. The market operates pretty well.

I haven't always felt as clearly about that as I do now. When I was in the Government I didn't exactly espouse this viewpoint as strongly as now. But as I have watched our economy and also other countries operate, all over the world, both as Secretary of Agriculture and now for more than a dozen years as CEO of Business International—I spend half my time outside the country—I have concluded that usually, when the Government gets involved in operating something or trying to forecast something, they fall flat on their faces. There aren't very many government-owned operations in the business of business who do very well anywhere in the world. It simply doesn't work. Running a business is not the function of government. Goodness knows, the most dramatic example of that is in agriculture. A massive failure in agriculture is one of the primary distinctions of the Soviet Union.

Worldwide the ineptness of government in business is becoming very clear even in developing countries that call themselves Marxists. Marxists? Most of them are begging for investment, trying to get technology and to get multinational companies to come in because they know that's the way they're going to be able to strengthen their economies. They know that, and they want the

least to do with the Soviet Union they possibly can because the bloody system doesn't work.

Mr. KARMIN. Let me just pose it to Mr. Schweke. What kinds of companies are being denied access to capital and some of the other kinds of proposals that you had?

Mr. SCHWEKE. There is a variety of different types of evidence that indicates this. For example, First National Bank of Boston did a study of small new and young firms nationwide in terms of access to capital, in terms of debt capital and commercial banks. As you know, most small entrepreneurs don't possess the ability to float public stocks or bonds or to access venture capital.

So, a commercial bank is a likely place for them to go. Now, from this particular study that was done by First National Bank of Boston, which isn't a radical outfit by any means, they estimated that at least 77,000 firms that had adequate debt-to-equity ratios were not getting capital. They also indicated that the younger the firm the more difficulty it had. They have since done a later study, a little more sophisticated one, that indicates some of the same things.

I will take the case of venture capital. Venture capital is now regarded as the savior of the U.S. economy. American venture capital can do no wrong. Well, I think venture capital is again very, very important in this society. You only have to hear about what's going on in West Germany, where they're trying to think about creating something like an equivalent to it. But we need to also think about what venture capital does and what it does not do. And if you think about it, OK, venture capital last year raised about $4.1 billion of new capital. OK. That compares to, first of all, $36 billion in common stock and about $52 billion in corporate bonds. Let's look back to 1977 when new venture capital firms were around $39 billion. It sounds like a lot of money, and people always say there's too much venture capital. Well, is that so or not?

Well, first of all, venture capital is very concentrated in only a very few States where most venture capital home offices are located. Seventy-seven percent of all these new funds are, in New York, California, Massachusetts, and Connecticut. If you talk about investments, they're even more concentrated: California, Massachusetts, and Texas. That's the first issue.

The second question is, what do they invest in? They almost always invest in the highest-tech type of operations.

Number three, what sort of rates of return do they get? They expect and want very high rates of return. And again the average return on venture capital average, from some studies last year, is around 25-26 percent. So they want a very high return on equity. How does the venture capitalist realize their gain? They take a firm public; they exercise what you call a "put," where the entrepreneur buys back his or her stock; or they are acquired by a larger firm. It's four times as likely to be acquired by a large firm as to go public. And again the initial public offerings are more important now, but they are still very limited. So if you're a firm that if you have a potential of less than $20 million worth of sales or assets, you're not going to be looked at by a venture capitalist.

There are groups of firms out there who could potentially create jobs. But venture capital won't invest in them. You think of the life-cycle needs of a firm, and there is a bit of a mismatch there.

Or, if you take another example, regulations that shouldn't exist. In most States and localities public pension funds can't invest in new or younger firms that are growing fast and temporarily not paying dividends because there are legal impediments. Just eliminating those legal impediments is very critical. When I talk about government action, some of the action is affirmative, in other cases, certain types of tax reforms, regulatory reforms where you have to look at specific cases and particular types of problems.

Mr. KARMIN. Are you snuggling up to RFC? A bank?

Mr. SCHWEKE. I would snuggle up to some extent. OK. Let me qualify that. Let me just say something very quickly about that. There are banks and there are banks. And there are different types of banks. There are different types of capital problems. I haven't been convinced, let's say, by any of the industrial policy stuff that we need this big institution that would do all things. There may be cases where there may be capital problems, but I don't think the problems of these more mature firms reside in capital areas.

I would argue that new young and small firms have some capital market problems. Some types of smaller target institutions—to take an example, in Connecticut, there was a thing called the Connecticut Product Development Corporation—are public intermediaries, that are outside the civil service. It gets about a 17 percent return on taxpayer equity. It does royalty financing. Again, royalty financing is very unusual and very distinctive. You get a royalty on sales. You don't have to liquidate your gain through taking it public, et cetera. It's halfway between debt and equity. I think that's very interesting. Again, it might be a possibility that the private sector might do that eventually. But again, masterminding and playing around the margins makes some sense.

Or, to take the example of a secondary market for long-term industrial mortgages, akin to GNMA or whatever, to do something like that would be a valid role for public action to set up such an intermediary that eventually could be spun off to the private sector. Fine.

Representative LUNGREN. I think my colleagues have noted that I have been uncharacteristically quiet here. Maybe I can just make a comment or reaction.

One is with respect to Mr. Schweke's presentation, I believe that I echo the words of Stan, that I think by and large many of the things you talk about as defining what the situation is and what the problems are, are true.

I have some real troubles, though, with the suggestions you make because it seems to me that if you talk about industrial mortgage insurance, or if you talk about a mini little bank, whatever you're doing you're not talking about creation of additional wealth or additional capital. You are talking about a redistributing of already existing capital, and you are assuming that some government agency by some hook or crook or, as you call it, masterminding around the margins or edges, can somehow do a better job of funneling the already existing capital to enterprises that would not otherwise receive them, which suggests obviously you are taking

capital away from those enterprises that would otherwise receive them.

And I don't see a track record anywhere that suggests that intervention will do a better job than the market. Where is that evidence?

Mr. SCHWEKE. Again, what I am simply saying is that there is some evidence I would argue. I think you're right in that unless it's invested more efficiently, you're taking from one hand to give to another. And there has always been some displacement. If you're investing, if you're shifting assets—a bank shifts assets from loans from X firm to Y firm—there is always going to be some displacement.

Let's say, if they create 100 jobs with Y firm, and formerly they created 90 jobs with the other, there is going to be some loss there. It's still a net benefit. I would argue again the Connecticut Product Development Corporation or something like the Massachusetts Capital Resource Company, which is a publicly chartered, privately managed, privately capitalized, are responsible areas of taxpayer dollars. There is a lot of room for innovation. Where the money comes from, how to structure the incentives, and so on. Take the example—again this is a more traditional example—of the Ohio State Teachers Fund which was one of the first public pension funds that invested in venture capital.

Representative LUNGREN. California just had one on the ballot—we just changed the requirements for judging whether proper investments were made with large pension funds. I think that makes ultimate sense. But the question is that you are talking about industrial mortgage insurance, which gives a protection that they otherwise would not have, which suggests that capital is going to flow where it wouldn't otherwise.

I just come back to the statement that I heard from Robert Noyes, the founder of Intel, who said that one day his wife came home and said, hey, I want to invest in this little company down the street in Silicon Valley. I think they are really going to do something. They want to make computers that are for personal use. He said that's a crazy idea. Don't invest in that. And he said, luckily she didn't listen to me. So, she invested in something called Apple Computers, and he said, if I—and he's being rather modest about it. He is one of the leading lights in the whole Silicon Valley and high tech in the United States—if I don't have the ability to make that judgment how can you assume that some government agency looking at these various things trying to redirect this type of capital is going to be able to do as well.

What I'm suggesting is it seems to me if you want to target the entrepreneurial process you take care of some of these problems, such as not allowing pension systems to look realistically at some of these things. But don't go beyond that to have these additional encouragements which are over and beyond what the market place is there for and seemingly does a better job of doing than we can do. That's the one thing I would suggest. I don't know why this tinkering and, as you call it, masterminding around the edges necessarily leads us anyplace except making a lot of bureaucrats and elected officials feel good, and perhaps get re-elected.

Mr. SCHWEKE. It depends again on the institution. Again, I would definitely agree with you that, in terms of some of the institutions, or initiatives, I'm concerned with the case that one needs to make for them is an harder one to make. But, again, take the example of industrial mortgage insurance. It's basically just like Ginnie Mae and Freddie Mac. The actual lenders are going to be throughout the U.S. hinterlands. They are going to be banks and savings and loans, not public lenders. And the institution meets a real need. There is a problem due to disintermediation, brought on by fluctuating interest rates and inflation. So, banks have a very great difficulty in laying out long-term capital.

Right now we do not have the securities of the scale akin to mortgage backed securities in the housing market that would allow large institutional investors like pension funds and university endowment funds, to invest in such companies. So, instead they pick up the phone and buy Fortune 500 stocks or bonds. Essentially all these would do is set up an institution, which would be public nonprofit and non-civil service initially. It could be spun off to the private sector.

So, anyway, we can go on and on about that.

Representative LUNGREN. Let me address one question to Mr. Freeman. It's probably a general question but it's one that intrigues us, and always comes up in political arguments and generally discussions with constituents. We are very much involved and have talked about some of the changes that have taken place with multi-national corporations as they've moved into the developing world, but we often get the argument that there is not much good in multi-national corporations. That's an overstatement.

But, that multi-national corporations, by their very nature, necessarily take jobs from already developed countries and necessarily export them to a lesser developed and the developing countries. That is a concept that is out there and it is largely believed. How do you respond directly to that criticism?

Mr. FREEMAN. I'm glad you asked that because it's an easy question to answer, but the hardest one to get across. The contrary to what you say is believed is the case. Export of capital creates jobs within the United States, not the contrary. Business International for 12 successive years had made a careful study each year with a floating sample group of about 100 multinational companies. Among said companies, the companies with the greatest proportion of their capital invested abroad have increased their jobs in the United States. Most regardless of the size of the company.

This has been a very carefully controlled and objective project. I'll be pleased to send you the results of it, for 12 straight years. The reason is for the conclusion I have stated. A company usually starts its international business exporting. After they build markets, they start getting local competition. Then they move to manufacturing in that area, in order to meet the competition. When they do that, a significant volume of components are exported from the home country.

When the Hartke-Burke bill was before Congress about a dozen years ago, Minnesota Mining in my State of Minnesota made a very careful survey: 10,000 jobs in that company in St. Paul, MN, were found to be directly dependent on foreign investments made

around the world by Minnesota Mining measured in terms of the volume of exports that resulted. So the argument that foreign investment exports jobs is totally phony objectively and demonstrably so. I repeat, foreign investment in the overall creates jobs. It does not export jobs.

Representative LUNGREN. I appreciate that because it is something that we have to deal with. We were talking earlier about the question of interdependence in the world and how to get that across to our constituents and the individuals. I suggest constituents have it very well in mind in terms of their purchasing decisions. Toyota is successful here, not because anyone forces people to buy those cars but for whatever reason they do buy those cars, we put some restrictions on the cars for various reasons based on some concepts, and if anyone is suggesting we are not interdependent, it's the restrictions that are placed by Congress that suggest that as opposed to the market place analysis done by individual consumers.

Representative EDGAR. Would the gentleman yield? I came in on the tail end of this discussion. I was in the earlier discussion and I just want to ask you to write down the comments you are making, because it's not talked about very much on the House floor or in debates and discussions. It's talked about in reverse. I suggest that you make 535 copies of that material available for distribution. I wonder whether or not there isn't a marketing problem of getting information like that out, not just to elected officials who may be misinformed but also to labor and to chamber of commerces and economic development professionals and to people who think of themselves as being in the real world. It seems to me, that when we talk about a new economy and we talk about new tools for understanding our interdependency around the world, we've to also say how do we get it out of the academic community and out of the research community and out of the thinking tank community. Materials that can be easily understood in what is allegedly the real world is needed.

Mr. FREEMAN. Again and again and again, we have sent this material to every Member of Congress. [Laughter.]

Representative EDGAR. How do you get Members of Congress to read it?

Mr. FREEMAN. We've also sent it out to hundreds of companies around the United States with enclosed press releases, with the suggestion that the executives should use it to make presentations in various public forums. I mentioned Minnesota Mining. The labor union at Minnesota Mining was represented during the years I was Governor of Minnesota by Joe Carth, who later became a ranking member of the Ways and Means Committee of Congress. That foreign investment created rather than exported jobs was demonstrated so clearly that the 3M union strongly opposed the Hartke-Burke bill. You are right. The question of exporting jobs is difficult to explain to people because it seems on the face of it that if you send capital outside the country you are exporting jobs. But that is not true for, and I repeat, when you invest abroad a company sucks out exports, and, that creates jobs at home. It's just that simple. But the obvious comes first.

Representative LUNGREN. Just at the time we are getting a real interchange here and maybe some debate, I've been informed we need to close. I want to thank those of us who are here joining me on the panel, and those of you who have been here and had to leave. I think we had an interesting discussion and hopefully it will generate some additional thought up here on the Hill and throughout those areas represented by the people in the audience.

Thank you for attending, and thank all of you. [Applause.]

[Whereupon, at 5:35 p.m., the conference recessed, to reconvene at 6 p.m., the same day.]

INTRODUCTORY REMARKS OF HON. WILLIAM V. ROTH, JR., A U.S. SENATOR FROM THE STATE OF DELAWARE

Senator ROTH. Good evening. It is my distinct pleasure tonight to host the last session of this all day conference on "the new economy." The conference has been sponsored by three congressional groups: The Joint Economic Committee, the Subcommittee on Oversight and the Economy, and the Congressional Clearinghouse on the Future.

The first two sessions covered the macro and industrial trends that are creating a new economy nationally and globally. Tonight, we will focus on a very dynamic area of the new economy—namely trade and investment policy. To discuss that issue, we are indeed fortunate to have with us one of the most respected experts in the field of international trade and investment policy, Mr. Robert Hormats.

For most of us, Bob needs no introduction; but, for those who perhaps do not know him, let me briefly outline some of his accomplishments. Since receiving his doctorate in international economics from the Fletcher School of International Law and Diplomacy, Bob has been one of the most active formulators of U.S. international economic policy. From 1969 to 1973, he served as a staff member for international economic affairs on the National Security Council. After spending a year as guest scholar at Brookings, Bob returned to the National Security Council where he served as a senior staff member for international economic affairs. In that capacity, he was the Senior Economic Advisor to Henry Kissinger, General Scowcroft and Zbigniew Brzezinski. His responsibilities included providing policy advice, and coordinating interagency positions on monetary, trade, development and energy issues.

More recently, from 1977 to 1979, he was Deputy Assistant Secretary of State for Economic and Business Affairs. During this period, he prepared and coordinated U.S. economic policies regarding Europe, Japan, and other countries. Bob left the State Department in 1979 to become Deputy United States Trade Representative. In this position, he chaired many U.S. delegations in negotiations with most of the Western industrial countries. He returned to the State Department in May of 1981, and remained there for a little more than a year, as Assistant Secretary of State for Economic and Business Affairs.

Today, as vice president for international corporate finance of Goldman, Sachs & Co. and director of Goldman Sachs International Corporation, Bob offers advice on international trade and finance

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to governments and private firms which are developing short- and long-term economic strategies.

Bob's insightful comments on international trade issues are always welcome on Capitol Hill. In particular, I would be remiss if I did not mention his recent appearance before my subcommittee of the JEC and last Sunday's op-ed piece in the Washington Post.

With that modest—if somewhat long—introduction, I would now like to welcome Mr. Robert Hormats.

REMARKS OF ROBERT HORMATS, VICE PRESIDENT FOR INTERNATIONAL CORPORATE FINANCE, GOLDMAN, SACHS & CO.

Mr. HORMATS. Three factors affect the trading system. One, the dollar and the international monetary system. Two, differential rates of growth. And, three, the problems of the developing countries. All of these combined have led to major problems for the U.S. and for the international economy. I would like to address each of them and try to give some thoughts on what sorts of progress we might make in dealing with them.

We get so tied up day-to-day in short-term issues that we often fail to reflect on the fundamental problems of the system. That's really the general spirit of my talk tonight, to try to give some sense not only of the immediate problems and pressures on the international economic and trading and financial system, but also of where we might go and what we should do about these problems, so that we can take a medium or a long term look at these difficulties.

First, the dollar is, from the point of view of those of us interested in international trade, a major problem. The dollar in trade terms is something on the order of 25 percent over-valued. To put it another way, the dollar's strength means that American exporters suffer from a 25 percent disadvantage in competing with foreign producers, and exporters to the United States benefit from what is, in effect, a 25 percent subsidy.

As a result, a lot of American firms have suffered a major deterioration in their international position over the last couple of years. The implications of this are significant both in the short and the long term. They're significant in the short term because the estimate of the Department of Commerce is that a billion dollars worth of exports means about 25,000 American jobs. So a deterioration of the kind we have suffered in our trade balance over the last two years has cost an enormous number of jobs. Just to give you an example, in 1982 we had a trade deficit of $37 billion; in 1983 the trade deficit, using the most conservative figures, was $72 billion; in 1984 the deficit is projected to be something on the order of $120 billion. That is a lot of jobs, and these jobs are in agriculture, industry, all across the country, so that is significant in its own right.

Another problem is that if you are an investor and you look around and see the dollar is over-valued, it is, from the point of view of many companies, very attractive to invest abroad and produce abroad, and this is what is happening. If American firms are making new investment decisions, they have a choice. Do they invest in the United States and suffer from this 25 percent disad-

vantage, or do they take advantage of the very strong dollar to buy weak currencies abroad and invest abroad?

A lot of investments are now taking place abroad because of the strength of the dollar. Now one might say this is short term. And it may well be, but it is the sort of decision that a lot of firms are making. And it has a long term cost, because once that investment is made, if the exchange rates turn around and the dollar becomes more competitive, the investment will be there and the jobs will be abroad and not in the United States.

The second element of the dollar question is its relationship to the budget deficit. What is the relationship between the budget deficit and interest rates, and interest rates and the budget deficit to the dollar? There are two points of view, generally speaking. One is the Administration's view, which is that budget deficits don't have an impact on interest rates and don't have an impact on the dollar. The other view says budget deficits have a major impact on both. My view falls somewhere in the middle: That is, when the economy is weak, budget deficits are quite appropriate because they stimulate demand; but during periods when private demand is very strong, budget deficits make the government compete in the private market for goods and services and for capital. People in the private sector today, the people who have money to lend, are very concerned about these budget deficits and they believe the government, at a time when it should be dramatically reducing its share of GNP relative to the private sector and should be reducing its need for borrowed funds, is now borrowing too much.

Government percentage of borrowing has gone down from about 40 percent of overall borrowing last year to something on the order of 26 percent this year. That is basically the way government share of borrowing declined in the last recovery. The problem is that in the last recovery, which was 1976–77, the government continued to reduce its share of overall borrowing from 40 to 26, 17 to 10, as the recovery strengthened. The probability now with these big budget deficits is that the government will not be reducing its share of borrowed funds by that amount, and that is having an effect on interest rates.

Now, the question of the dollar. One reason—certainly not the only reason—the dollar has held up is because American securities, interest-bearing securities, are very attractive vis-a-vis their counterparts abroad. If you assume the rate of inflation today is 5 percent, and you can get 14 percent interest on certain securities, they are attractive. Government backed securities are paying something on the order of 13 percent, so that you get a totally secure investment and you're earning a real interest rate of 8 percent. It's a very attractive proposition.

The problem is that for every additional dollar that comes into the United States, the risk to the investor of the next dollar is greater because, as dollar holdings abroad build up, the likelihood of some decline in the dollar increases. Therefore, to attract the next dollar and the next dollar and the next dollar, there is slightly greater requirement for more attractive interest rates. That is part of the problem, just to keep the same foreign flow of dollars coming in, the same degree of foreign investment, you have to get

some increase in interest rates, because the risk is greater for that next investor of dollars.

There is a very direct relationship between interest rates and the dollar. This is not the only cause of the strong dollar, and I think to that extent the Administration is right, but it is certainly one and probably the major cause.

What happens if interest rates go down, will there be a massive exodus from the dollar? That depends on a number of things. If the budget deficit is cut, the probability is that we will not have a massive exodus from the dollar, but the people will go out of things like bonds into stocks because interest rates will fall. The probability of sustained non-inflationary growth is improved and stocks become a good investment. Therefore, you will probably not get as dramatic a reduction in the dollar if you get a big budget deficit reduction. That is an important thing to bear in mind, that you're not necessarily going to find a major reduction in the dollar because of a budget deficit cut. This doesn't mean that budget deficits shouldn't be cut, it simply means that it is not a panacea for the dollar.

If, on the other hand, interest rates drop in the United States, and at the same time the inflation situation begins to deteriorate, then the probability is there will be a dramatic weakening of the dollar. That will happen because bonds and interest-bearing securities become less attractive and stocks become less attractive because of lower growth prospects. So all these things are, to a large degree, interrelated. A lower dollar, if it does occur, will of course have some beneficial, indeed probably a major beneficial, effect on U.S. trade after a certain lag.

Second, beyond the question of the dollar is the fact that the United States is growing much more rapidly than other countries, and that means the United States is sucking in a lot of goods. We're a strong market for foreign produced goods and foreign markets are weaker markets for American produced goods since they're not growing as rapidly. The fact that people are investing in United States to benefit from American growth is good because that investment helps to foster further growth.

The third part of the problem, the third reason for the very large U.S. trade deficit, is that our biggest developing country markets are very weak because of the very large debt problems they have. The United States has suffered an enormous reversal in its trade with Latin America. In 1981 the United States had about a $3 billion trade surplus with Latin America. In 1983 it had close to $17 billion trade deficit. That is the biggest single reversal in our trade balance that we've had with any area, including with Japan. There has been a slight deterioration in the trade balance with Japan in those two years, and an enormous deterioration in the trade balance with Latin America. It's largely because Latin American countries, with their very high debt, can't borrow very much, and borrowing helps generate trade. They simply don't have the resources to import, so that has caused a major decline in our exports to them.

In addition, when their exports do pick up—which means that they earn more foreign exchange—they use a lot of that foreign exchange to pay off the banks, whereas in the past when their ex-

ports increased they had more foreign exchange, and they used the foreign exchange to import. Since Latin America is the biggest market for U.S. products among the developing countries, those imports came largely from the United States.

So all of these are major factors in the U.S. trade deficit and major problems that the United States has to deal with. Now, how do we deal with them and what sorts of answers are there for addressing these problems? The first point is that there are no easy answers. There are a lot of gimmicky solutions to the debt problem that people come up with, but these are really not fundamental. They're really more useful from an academic point of view than from a policy point of view or a substantive point of view.

Let me just touch on a few elements of the problem. First, what the developing countries are facing now, in addition to facing a debt crisis, is a crisis of growth and development. That is because many of these countries have had to undertake major austerity programs in order to earn more foreign exchange to repay the debts. A lot of that adjustment was necessary because many of these countries were importing more than they should, and were financing those imports with very large build-up of debt from abroad. So some degree of retrenchment, some degree of adjustment, was necessary. But the degree of adjustment that they're undertaking now has caused major social and political problems—riots in Santo Domingo, riots in Brazil, all sorts of things. Now this doesn't mean that governments are going to be overthrown, and doesn't mean that at the slightest outbreak the United States has to panic. What it does mean is that some effort is needed to ease the adjustment process, recognizing that the adjustment is needed, recognizing that some austerity for a period of time is needed. The question is: How do you soften the political and the social implications of it, because if the austerity is destabilizing, it means that the governments who are undertaking these austerity programs may find themselves out of office and therefore, of course, unable to undertake the programs that they're committed to. This is one element of the problem.

There are several things that can be done in this area. Let me just tick off a few areas that I think are particularly useful to think about. One is how to deal with the developing countries' debt problem. There are two or three things that need to be done. Some are in the short term category, others in the longer term category. First, many of the developing countries, because they can't get spare parts, or raw materials or new equipment, simply are growing at a very low rate. They can't produce enough for their domestic economies, which generates a lot of inflation, and they can't take advantage of export opportunities because of these constraints, which reduces their ability to repay their debt.

One thing that is useful from our point of view is to, on our own and in conjunction with other industrialized countries, strengthen export credit facilities so that we can export more to these countries which helps create jobs here and it also helps these countries to generate a high rate of production which reduces their high rate of inflation and enables them to better repay their debt. We have done this for Brazil and Mexico. It strikes me that it would be useful to broaden this program to a number of debt troubled coun-

tries and, very importantly, get the Europeans and the Japanese to do the same thing. It is noteworthy that both Europe and Japan have really not made the sort of vigorous contribution to dealing with the debt problem that they should, and this is one way they can do it.

Second, many of these countries need to restructure their economies. The reason Latin America got into trouble is that their economies are less competitive than their counterparts in East Asia. It's interesting to note that Korea has a debt level that is Number 4 in terms of size in the world, below Brazil, Argentina, and Mexico. Korea is Number 4, and yet Korea is not encountering a debt crisis. The reason is that Korea exports a much larger portion of its GNP than do the Latin countries and therefore Korea is better able to earn the foreign exchange needed to repay their debt. The Latins, for a lot of domestic reasons, a lot of structural reasons, are not competitive internationally in many areas. Unless they are able to strengthen their underlying economies, it's going to be awfully difficult for them to deal with this debt problem and to avoid getting buffeted around by world economic difficulties in the future. So, structural adjustment lending from the World Bank and the other institutions, I think, at this point is particularly important. But it's also important that these countries improve their own attractiveness for foreign investment.

A number of Latin countries have what one might call a porcupinish attitude toward foreign investment, they have resisted it in the past. Whereas Korea, Taiwan, Hong Kong, a number of countries in East Asia, have been very fertile areas for foreign investment and that has helped them to get new technology. A lot of the companies that have come in have been export-oriented so that has been helpful to them. Now, Latin America is going to have to accept the fact that a little bit more foreign investment is not going to threaten their national sovereignty. The question, of course, is how to do it. A lot of people are reluctant to buy existing Latin American companies because they're weak and not very profitable at this point. But it seems to me that certain things have been very useful in the United States in improving the marketability of corporations. For example, the Securities and Exchange Commission, by publishing certain date requirements and certain reporting requirements, has assured that enough information is made available to future investors. That we have a very active equity market in the United States is largely because there is something like the SEC. What we might think about is ways of insuring that there is a greater degree of international uniformity with respect to information disclosure and things of that sort, so that foreign investors will have more confidence that the information they get about companies abroad is valid information. It won't change the laws of countries that are very restrictive about foreign investment but it can provide outside investors with a greater degree of knowledge and understanding which is a prerequisite to additional amounts of foreign investment in many of these countries.

Third, I think in the final analysis the trade and the monetary and financial areas are closley interrelated. There is no question but that a contraction of the trading system, greater protection in

the trading system, is going to make the debt problem difficult to resolve, because debt is really postponed trade, and if these countries are going to get out of their debt situation they are going to have to be able to export more. At the same time, we in the United States are not feeling particularly generous about allowing a lot of developing country products into our market. Europe and Japan are of the same mind. So the developing countries are not automatically going to get access to these markets if they do become more competitive. It's going to be very hard to convince American workers that they should allow in more steel or shoes just to help countries to repay money to the commercial banks. That is not a very wholesome political equation from the point of view of those of you who have to deal with these pressures on a day-to-day basis. The only way that one is going to be able to deal with this and open the system more is to try to develop some type of momentum internationally to improve the trading system.

This gets to another point. That is, the trading system today is in deep trouble. It's facing a crisis because it deteriorated: The rules have become antiquated and rusty, and people are simply not going to the GATT (General Agreement on Tariffs and Trade), not honoring their GATT obligations. This is true of industrialized and developing countries. We're no worse and we're no better than anyone else, everyone is doing it. We may even be a little better than most in terms of our responsibility. But what's needed is some degree of international momentum to improve the trading system and I think that it is not unrealistic to hope that we can by the end of next year make the first steps toward some type of international negotiation. I don't think we're ready for a Tokyo Round or a Kennedy Round which were designed to reduce trade barriers. I think that we're not at that point yet psychologically and, for the most part, we wouldn't get very much support within this country or abroad. Europeans are lagging behind the United States in that and are resisting a liberalizing negotiation.

But there are ways of improving the trading system and setting the stage for a liberalizing negotiation. In particular, we ought to try to have a negotiation involving at first not all the countries in the GATT but a small number of industrialized and developing countries. Those countries ought to concentrate first on some prior notification scheme for new trade actions by governments. New governments take actions and they don't tell anyone what they're going to do and governments in other countries find out about it later. Some sort of prior notification would be useful so that people know what others are contemplating and so that before actions are taken there are efforts made to find ways of reducing the adverse impact of those actions on other countries. The country that is undertaking the action can at the same time put forward an adjustment program to assure its trading partners that those actions can be phased down and out over a period of time. It seems to me that this is something that can be done, linking trade restrictions to some sort of adjustment action which will ultimately lead to their not being needed any more. If these types of procedures are developed and are credible, then the prospects for a liberalizing effort would be greater and then you can add more countries both developed and developing. That type of approach could be useful. It's a

little like the non-proliferation treaty. If we had waited until all the countries that had nuclear weapons had joined the non-proliferation negotiations, we would not have had a negotiation. It's the same thing in trade. If you get a few countries that are interested and want to move forward, try to negotiate something with them, and let others join in as they go along.

The last point I'd make is about the monetary system. I talked a little about the dollar and I note that there is a good deal of interest here with respect to the dollar. One thing that could be done is to try to get at least enough understanding internationally as to what constitutes early rate danger zones—by danger zones I mean the point or zone where an exchange rate becomes so distorted that it causes distortions in international trade which generates a high degree of protectionist pressure here or abroad.

Ten years ago I would have thought it was impossible to get an agreement by the United States to any type of zones of this sort. We had just abolished the Bretton Woods agreements and people thought floating rates were the best things since sliced bread. It was also true that very few Americans understood the impact of exchange rate distortions on the American economy. Today I would venture to say that most workers in plants that are competing with imports or products for export, understand that the dollar is a problem. And most people in the agricultural community understand this. Virtually everyone now realizes that an over-valued dollar is harmful, and an under-valued dollar, as it was several years ago, is also harmful—for different sets of reasons.

There is enough understanding in this country to begin to move toward a consensus that we should do what we can to avoid exchange rate misalignments which distort trade. Now, there are no easy answers to this. If there were, we wouldn't be in the situation we're in now. Getting some general agreement among finance ministers and, very importantly, trade ministers sitting down together, as to where rates are likely to lead to distortions in trade, how far misalignments can go without hurting trade, would provide a framework for developing policies to avoid major and trade distorting currency misalignments. These are things which can be done. Over a period of time we need to develop a greater consensus internationally to insure that some of these measures are done.

Let me conclude by saying that what we need to have today is an integrated trading system. There is a ricochet effect: What happens here affects Europe and affects Japan. If Europe puts import restrictions on autos, Japan sells less autos to Europe and pushes more autos in the Japanese market. When the United States restricts trade in agricultural exports to the Soviet Union, it doesn't mean the Soviets don't get the grain, Argentina supplies the grain, or someone else supplies the grain. So there is really one world trading system. It's even clearer that there is one world capital market. People who advocate capital controls don't realize that anyone who wants to buy or sell dollars can do it in New York, or London, or Singapore, or Hong Kong, or Abu Dabbi—virtually anywhere in the world—and there is no way, by putting on capital controls, to influence the value of the dollar, because dollars are traded against deutsche marks and francs and yen all over the world. When the New York markets close, Tokyo and Singapore

are open. When London closes, New York opens. There is sort of a constant world capital market, it's always turning and always making transactions.

We have to recognize that if we're going to deal with these sorts of pressures, we're going to have to find some way of having the major governments work together to insure that their domestic policies don't lead to flows in capital which do have a distorting effect on trade.

Finally, we're going to have to realize that the developing countries are extremely important to our own exports and to the American economy. Also, they obviously have a political and security significance to the United States. This is particularly true in the case of Latin America. Somehow these countries who have been small players in the system—the monetary system, the trading system—are going to have to be brought in. Not that we have to give away the store in order to get them to come into the system, but somehow we've got to integrate them into the trading system and the monetary system.

A VOICE FROM AUDIENCE. You suggest international danger zones. Wouldn't it be better to simply go to the root of the problem and try to reform domestic fiscal policy, for example, bring budget deficits down, and isn't danger zone an excuse not to do the domestic things that we need to do?

Mr. HORMATS. First, let me say that you're absolutely right. The reason Bretton Woods fell apart with fixed rates was not just what the United States did in August of 1971. It would have fallen apart anyway as a result of the energy crisis and differential rates inflation. My point regarding danger zones is not that they are target zones for intervention. What I'm saying is that if the dollar gets significantly over-valued or under-valued, it's going to cause harm to the American economy. Intervention is not going to be the answer. Intervention can be useful at the margins, but it is not a fundamental answer. My thought was more that what you do is try to factor into your domestic policy some judgment as to what those domestic policy decisions are going to do to your exchange rate. That is to say, recognizing that exchange rate misalignments have an adverse domestic policy effect, we begin to plan or to take that factor into consideration in developing the monetary fiscal policy mix. That's really what I have in mind, not so much the intervention of the old Bretton Woods type but try at least to be sure that domestic policy does not lead to such things as an over-valued or under-valued exchange rate.

A VOICE FROM AUDIENCE. Are we able to say, if we don't handle our budget estimates it's going to cost two million jobs in the export sector?

Mr. HORMATS. You can't be as precise as many of us would like to be. There's a joke that economists make their predictions in tenths of percentage points to prove they have a sense of humor. You can get a general sense, though, that if we have extremely high interest rates in the United States and very low interest rates in Western Europe, we are going to get a lot of pressure on the dollar. No one knows for sure that interest rate X is going to lead to a dollar that's worth 230 yen or 220 or 240. If you had asked most economists four years ago, or three years ago, what the impli-

cations of very tight U.S. monetary policy would be, most would have said that would lead to upward pressure on the dollar. Now, very few people with any degree of humility would have been able to tell you exactly what that level would have been, but most people would have been able to say that would have caused a misalignment of exchange rates of some sort. I'm not arguing for enormous precision here, I'm simply saying that the exchange rate consequences of domestic policy action should be one factor taken into account in the way we do our fiscal monetary mix. But you're quite right, I would not want to go back to the pre-1971 thing which really led to an awful lot of currency crises, which people who like fixed rates don't remember. You hear a lot of people saying, let's go back to Bretton Woods, but that would be a terrible mistake and we would not have learned the lessons of history.

A VOICE FROM AUDIENCE. If the Administration says there is no impact on domestic economic policy, they say the budget deficit doesn't affect interest rates, so——

Mr. HORMATS. For an Administration that puts as much faith in the market as this Administration does, it seems to me that they have to give some weight to the fact that everyone in the market, I mean everyone in the market, believes that there is a link. You can't have it both ways. If you put faith in the market then you have to trust the fact that the market has made a statement on this point. There is no one, no one I know, who deals with these issues who does not believe there is a link. And people act on that basis. In the markets everyone now is less willing to take risks and therefore charge the higher interest rate for their money because of this concern. And I think you're right, if an Administration here or abroad simply denies the link, you can't make this work.

A VOICE FROM AUDIENCE. This is what they're doing.

Mr. HORMATS. And I'm not saying it's going to work now. I'm simply making a general point that exchange rates today have a much greater impact on the domestic economy than before and one cannot say that what government does has no effect on exchange rates. Very few people would accept that argument. I'm simply saying that recognizing that there is an impact, try to find some way of factoring that impact into domestic policy. I don't think everyone in the Administration believes there is no link, by the way.

A VOICE FROM AUDIENCE. You talked about the dollar and what's going to happen to it——

Mr. HORMATS. It's hard to predict what the dollar will do. Everyone has been saying the dollar is going to decline. It started to decline a little bit and then went up and then declined a little bit. There were strikes in Germany and it went up again. If you really got a big decline in growth in this country and a decline in interest rates at the same time, you would get a lot of people moving out of the dollar. There is a lot of strength in the American economy. It's still by far the strongest economy in the world. If the dollar started going down and declined by 15 or 20 percent, then you'd get a sort of natural stabilizing force somewhere. For the next several years, it is very hard to imagine that we're going to be able to get very much additional export growth because of the dollar.

A VOICE FROM AUDIENCE. Jobs are going to be generated through exports or somewhere else.

Mr. HORMATS. For the most part we're going to have to rely on domestic demand rather than exports. I really don't see in the next two years or so that we're going to get a big increase in exports largely because of the dollar and the debt situation which is not going to get much better in two years. The export picture is not very encouraging for the next two years. Even beyond that it's not encouraging for the investment reasons that I mentioned earlier. We're facing not only an immediate problem but some real structural problems that are going to hurt us for two, three, four years. It could turn around but I don't see any reason why it would unless there's a big drop-off in the dollar and then that would be a drop-off occasioned in part because of very low growth in the American economy which we wouldn't want either. It's not a happy picture, to say the least.

A VOICE FROM AUDIENCE. You've talked a great deal about the Third World and Latin America, what do you see happening in Europe?

Mr. HORMATS. I think it's not particularly good in Europe. If one looks at the last ten years, which to be sure are not necessarily an indicator of the next ten years, Europe has created no net jobs and the United States has created nearly 20 million new jobs. Europe has structural problems. American workers are mobile, you can go from Boston to Santa Fe. In Europe you can't even go from one part of Belgium to the other because of linguistic problems. Europe is a much more restricted society in the broad sense of the word. They don't have much of a venture capital market. European firms come to the United States to get venture capital to use in Europe because a lot of resources are managed by very large banks who have relationships with relatively large companies, and then governments distort things by huge subsidies. So much of Europe's resources are locked into somewhat inefficient patterns because of agricultural subsidies, steel subsidies, so that you don't get that sort of mobility, you don't get the risk factor in Europe which is important to making the American economy work.

Europe does a lot more R&D than we sometimes give it credit for, but the real question is, is it being used in the right way? For instance, Germany has an R&D budget, to be sure, but Germany has really relied very heavily on big industries, heavy industries, and those were export-oriented. Since 1971 almost all, I'd say between 80 and 90 percent, of German growth has been export led. Very little growth in domestic demand. France is capable of generating more domestic growth than some other countries but it now is suffering from a whole lot of problems. So I don't see that we're going to get a really robust European recovery. Italy is a dynamic economy, but the numbers don't indicate it because so much of the economy is outside the recorded sector. But it's very dynamic, there's a very substantial deregulated part of the Italian economy which works.

A VOICE FROM AUDIENCE. Do you see anything beyond doom and gloom? It seems to me that we've talked about doom and gloom of the economy, yet we survive year by year.

Mr. HORMATS. First of all, I think the American economy is still very, very strong. We've created a lot of jobs and, while the export sector is not going to look very good, we have tremendous growth

potential in the domestic economy. There's a tremendous dynamism in this economy, even more than Japan, because it's a more balanced economy than Japan's. In Western Europe I don't see very much. The developing countries, if they really applied the right sort of medicine in the near term, they are capable of very solid growth over the longer term. East Asia is obviously a very dynamic area. Brazil—there's a joke in Brazil that Brazil is the land of the future and always will be. It never realizes its full potential, but if it ever got going it would be an extremely powerful trading partner of the United States, which would compete but would also be a good market. Africa is deteriorating; the economies are really going downhill. Some economies in Latin America, East Asia and Japan are going to be very strong, balanced economies. You may get a resurgence in a country like France, if it can get through difficult times. So, in the medium term I'm not overly pessimistic.

We've probably learned an awful lot over the last ten years, and if there is one message, it is that we have had difficult times but those times have not been totally worthless because we've learned a lot. What we've learned is that governments can play too large a role in economies and weaken the economies as a result; over-regulation, over-subsidy, distorted exchange rates, a whole lot of things that get in the way of growth, are troublesome. The developing countries, almost all of them, had over-valued exchange rates. In Latin America, almost all of them had huge government subsidies which made their economies less efficient. I think there's a greater likelihood that both of those things will be avoided. I am not overly pessimistic about the medium term. We've got a lot to do in the next couple of years to put the system back on kilter, but it can be done. If you go to Brazil, it's amazing what they're doing—agriculture is booming. We embargoed soybeans to the Japanese, the Brazilian soybean exports to Japan are booming. Argentina, which never exported any grain to the Russians before our grain embargo, now exports in a good year ten million tons of grain to the Soviet Union. Some of these countries have taken advantage of opportunities. The Brazilians are now reducing oil imports; they're exporting oil products. There's just a lot that's going on. They're flexible enough economies to take advantage of some opportunities and I think they'll be more flexible in the future. So I'm not overly pessimistic although we're going to have some sleepless nights getting there.

A VOICE FROM AUDIENCE. Are there some things like population and resource depletion that may have an impact on the economic future that has to be measured?

Mr. HORMATS. The big population conference in Rumania several years ago didn't get anywhere because some countries said, "We don't want the Northerners telling us to limit our population, this is part of our national strength, or whatever." That is a cloud over the horizon for a lot of countries. We, with our very low population growth, are not immune because people are going to come over from Mexico and Haiti and El Salvador and Colombia, and we're going to have people coming into the United States.

What troubles me a lot is that there is a tremendous amount of deforestation going on and that's going to have a long-term economic effect on a lot of countries. It already is in West Africa. One

huge problem in the Philippines is stripping the forests; during the energy crisis a lot of forests were stripped and they're trying to replenish them. These are two big problems and I'm afraid they are so hard for the political system to deal with because they don't seem to be urgent. They're not like the energy crisis with long lines—they're sort of indented. They are building in this society and I don't see any easy answers yet. If we don't address them, we're going to pay a huge price over the long term. Some say that the resource problem is being addressed, in part, because if you use up too many resources the price will go up and the market will allocate. To a degree that's true, but it's true with economic resources. It's not necessarily true with things like forests where, if you live in some place like the Sahel, you need a little bit of wood to burn every day and you go further and further away to strip the forests. It's those sorts of resources that I think are going to go because they're not really economic, they're more social and people have to have them in order to live.

A VOICE FROM AUDIENCE. When dollar liberalization began, did it have much of a positive impact on our balance of trade?

Mr. HORMATS. No. I think that it was good that the Treasury and the Japanese Finance Ministry agreed on that. That was very positive, but it's not going to affect the value of the yen very much at all. I wish it hadn't been sold on those grounds because now people are going to expect more of it than it can deliver. Let me give you an analogy: People say liberal yen will mean stronger demand for yen, stronger yen. This is the question I responded with: It's a fact that the dollar is an international currency today, no one denies that. Does that mean the dollar is going to be over-valued or undervalued at any given point? No one can answer that question. In the same way, you can't answer it for the yen. At any given point, the value of a currency depends on a whole lot of factors. The U.S. dollar, which is internationalized, is strong when interest rates are high, it's weak when people have no confidence in it. But its value has no relationship at all to whether it's international currency or whether it isn't. The yen was strengthening a little bit, the yen went down today, not because of liberalization, just because factors in the money markets changed. They've done a good thing, they just should have not oversold it. I see why they did it, because it reduces pressure for protection in the United States, but I think that people are going to be a little disappointed when it's not the great panacea.

[Whereupon, at 9 p.m., the conference adjourned.]

APPENDIX

TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE 24, 107–124 (1983)

Global Consequences of Improving Productivity*

THEODORE J. GORDON and JOHN STOVER

Introduction

World population today stands at about 4.6 billion and is growing at the rate of about 1.7% per year. About 1.8 billion, or 39%, of these people are in the labor force. Precise figures on unemployment do not exist but the International Labor Organization has estimated that as many as 450 million people, or 25%, are unemployed. Obviously, this is a vast oversimplification—employment exists at different levels of intensity. Many people who are out of work and who would like to work have simply become discouraged and have given up seeking employment; many people are employed in "off the books" activities and are simply not counted in any kind of official surveys. Nevertheless, this datum is the best at hand: unemployment, 25%.

Unemployment, underemployment, and poverty are unholy handmaidens. Without work, the poor remain poor. Without work, there are no savings to stimulate capital investment. Without work, political structures—even political ideologies—cannot survive.

Through the early 1960s, the common wisdom held that poverty and unemployment in developing countries could be overcome by increasing productivity and improving economic growth in developing countries. Policies of the United Nations were generally directed toward this end. The implicit assumption was that if economic growth could be achieved, employment would increase and poverty would mitigate.

By the mid-1960s, however, questions were being asked about whether the fruits of development would "trickle down," about whether the route to development was important in alleviating poverty. Today, the policy emphasis seems to have shifted from economic growth to a more direct focus on employment-based strategies and, for better or worse, to strategies that stress redistribution of wealth from rich to poor.

The situation is enormously complex. Any fair and comprehensive examination of the problem of reducing poverty would have to be concerned with not only the productivity of labor, but the productivity of capital, the prospects for accumulating capital, the economic overhead caused by unfortunate and burdensome dependency ratios, sectoral

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THEODORE J. GORDON is President of the Futures Group, Glastonbury, Connecticut. JOHN STOVER is a member of the Senior Staff of the Futures Group. Address reprint requests to Mr. Theodore J. Gordon, President, The Futures Group, 76 Eastern Boulevard, Glastonbury, Connecticut 06033.

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differences that exist in the balance between productivity, employment, and income, and many other concomitant social, economic, and political factors that affect the status and prospects for the individual.

In this paper we have addressed only a small—but very important—part of the problem: the relationship between economic development, productivity, population, and employment. Stated simply, we set out to compare available manpower with required manpower, that is, to find the prospects for employment in developing countries, given the realities of population growth and expectations about changes in productivity and economic growth. We shall present a more detailed explanation of our approach shortly but, to set the stage:

> Working with a unique data base, we forecasted GDP sectoral distribution and labor force productivity that could be expected in the process of development.
> Then, using detailed demographic projections, we computed both the expected number of people who would be in the labor force in developing countries over time and the employment required to achieve a given level of national achievement.
> We reasoned that if the available labor supply exceeded the employment required to achieve a particular level of growth, unemployment, underemployment, or, at very least, increased leisure would occur. If, on the other hand, the size of the labor force required was larger than the expected number of people in the labor force, incentives would exist for increasing productivity or participation rates.

As a result of this work, we shall be presenting a number of forecasts which, for most countries, indicate the likelihood of excess labor. Our plan in presenting this material is to begin with a brief discussion about the technological revolution that makes these questions timely and relevant. Then we shall describe our sources of data and modeling approach. Finally, we shall present our conclusions about future prospects for productivity and employment.

The Technologies

We are entering an era in which enormous improvements in productivity can be made in most sectors by the application of capital. In many instances, for a given level of improvement, capital requirements will diminish (for example, through the application of complex electronic instrumentation and robotics). Although improvements in productivity will almost certainly accelerate economic growth, these improvements can be at the expense of jobs. Initially, when computers were introduced there was a great deal of concern that unemployment would result wherever computers were used. In fact, this was not the case; wherever computers were used, more jobs were created. The common wisdom holds that this situation will always continue, but this might not be so. Electronic devices are so advanced and the prospects for automation so bright, that the net effect of introducing such new technologies may be to improve total output with less labor required in both a relative and absolute sense.

Increasing productivity of the sort provided by these technologies leads to increasing income per worker, a major goal of development. If, however, increasing productivity also leads to less employment, the result could be higher incomes for those working and poverty for those who are unemployed.

Technologies that affect jobs are of two general sorts: *evolutionary*, that is, technologies that exist in developed countries and reach developing countries through normal mechanisms of geographic diffusion such as trade, offshore operations of multinational

corporations and foreign education; and *revolutionary*, that is, technologies that bring profound, step-function increases in productivity in both developed and developing countries. While many revolutionary technologies are currently apparent, they are not yet present in any economy. In the first category is a great array of agricultural and manufacturing machines and management techniques that include tractors, combines, large-scale earth-moving equipment, PERT scheduling, and numerically controlled machinery. In the second category are technologies such as robotics, genetics, and automation of design and manufacturing processes.

Diffusion of evolutionary technology from developed countries to developing countries has been and is well under way. In agriculture, industrialization is proceeding in almost every country. For example, smaller percentages of the labor force are engaging in agriculture, almost everywhere.

In Brazil the percentage changed from 45% in 1970 to 36% currently.
In the Ivory Coast the percentage changed from over 90 to 85% during the same period.
In Indonesia the percentage changed from 75 to 64% over the last 10 years.

Industrialization can also be measured in terms of mechanization:

In 1970 Chad had 93 tractors; today it has over 150.
Pakistan had 200 harvesters in 1970, and today has over 450.
Peru went from 10,000 tractors in 1970 to over 13,000 currently.

Although labor costs are important in determining the pace of introduction of evolutionary technology, policies unrelated to labor supply can also be important: exchange rates, subsidized credit and import duties have promoted the spread of mechanization in such countries as Pakistan, Egypt, and Brazil.

It is the revolutionary technologies that promise profound change and will lead both developed and developing countries into uncharted economic areas.[1] Genetic techniques, for example, can greatly affect agricultural productivity. Through genetic techniques, plants may be modified to become more disease resistant, require less irrigation, become tolerant to irrigation with brackish water or saltwater, reduce photorespiration, and improve photosynthetic efficiency. Genetic techniques also might lead to the creation of new plant strains that are essentially self-fertilizing.

Genetic techniques can improve productivity in other ways as well. Using genetic techniques laboratory scientists can take scrapings of the fungus that causes southern corn leaf blight, extract individual cells, strip the cell walls to obtain the protoplast, and in a remarkably short time select out cells that are resistant to the toxin. Ordinary breeding methods would take several plant generations, but such tissue culture permits location of the "one-in-a-million" resistant cell within a week.

Cloning of individual plant cells should certainly be feasible. This would permit

[1]The technological forecasts mentioned here are drawn from a study conducted by The Futures Group that involved interviewing agricultural scientists around the world. Staff members of The Futures Group talked directly with 240 or so experts in agronomy, agricultural engineering, animal science, aquaculture, climatology, entomology, plant breeding, molecular biology, water use, and other technologies. The people interviewed included those in scientific communities in the United states, the People's Republic of China, the Philippines, Japan, Israel, France, and West Germany. These people were actively engaged in basic and applied research in academic institutions, government and quasigovernment facilities, and private business firms.

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developing new varieties through laboratory production of seedlings. To date, the technique has been most successfully applied to floral crops, and it is now possible to have an entire greenhouse full of identical flowers. Work will soon be going on to adapt the technique to rice, carrots, and tobacco.

In our recent study of agricultural technology, we reached the conclusion that genetic technologies of the sort just described have a potential for increasing productivity by 10–20%.

Other nongenetic techniques also promise to improve productivity or increase the acreage in productive use. These include the following:

Advanced irrigation and water use technology. Drip irrigation is close to the ultimate potential in high efficiency water use, but cost limits application to high-value crops. Alternatives for other crops include low energy precision application (LEPA) and surge-flow irrigation. Laser-leveling is a proven method of reducing irrigation water requirements.

Hybridization of plants not currently hybrid and development of new crops. Breakthroughs are being reported in developing hybrids for wheat, cotton, beans, and improved rice hybrids. A perennial corn plant is a possibility. This should result in substantial increases in wheat, cotton, beans, and rice yields.

Improved protein content of forage crops. Immediate gains are most likely to be derived from improved management of forage crops—determining optimum time to cut, field drying methods, handling methods. A major goal is rearing beef and dairy cattle entirely on pasture, which may become feasible given development of high-protein grasses. This would have the effect of freeing grain now used in feedlot beef production.

Improved saltwater tolerance in plants. Two different approaches are promising: changing irrigation techniques and plant-breeding for salt tolerance. Drip irrigation allows growing some crops with seawater for irrigation. A California researcher has grown barley using undiluted seawater on sandy soil. Tissue culture and somatic hybridization should speed development of salt-tolerant varieties. This would eliminate the need to "desalinize" land plagued by salt buildups, and result in opening of marginal lands to production, particularly in arid and coastal areas and slowdown in depletion of freshwater reserves.

Marine farming and aquaculture. This is an infant industry, wide open for exploitation. Many LDCs are ahead of the developed nations in fish-farming technologies. While disease control will become an important problem with larger, confined fish populations, there is considerable potential for integrating fish farming with agriculture in LDCs. Fish are becoming an increasingly important source of protein in human diets and the trend is likely to continue. Fish production does not compete for resources used in production of other forms of food.

New cultural practices. There is a major trend toward multiple cropping and minimum tillage in order to increase output per acre and reduce inputs required for production. Further development of short-season varieties will speed the trend toward multiple cropping. Minimum tillage is a compatible development because it decreases the between-crops time interval required for land preparation. This would increase annual output per unit of land area and reduce costs per unit of output.

New designs for pesticides. Integrated Pest Management (IPM) is on-line and being adopted internationally. New developments are likely to center on more narrow spectrum pesticides to minimize adverse environmental impacts. Most current interest

is in a "biorational" approach. This would provide a gradual reduction in pesticide use per unit of land in crops.

These and other technological developments suggest that the number of people required in agricultural production can drop, while agricultural production grows at a rate that keeps pace or exceeds population growth rate, even considering the lag in technological diffusion from developed to developing countries. However, it is not obvious that these technologies *will* be employed because the realities of politics, economics, and infrastructure control the rate at which agricultural practices change.

This litany of technologies-on-the-threshold raises Promethean images. Growing world population demands increased agricultural output and this probably outweighs all other considerations. But to the degree that such technologies promise output with lower labor content per calorie, employment growth may not keep pace with output growth.

The situation in manufacturing and services is simiar. Here the key technological discontinuity is automation—the integrated circuit and its myriad applications: communications, entertainment, education, design production, office machinery, timekeeping, organization and retrieval of data, conversion of data to information and information to policy. These and the agricultural technologies suggest a vast potential for increased economic activity. To call the next two decades the time of the new agro–industrial revolution may lack literary pizzazz, but may be quite literally accurate. An attribute of many of these technologies is their ability to increase output with lower labor input, and this feature concerns us here: Will economic activity grow fast enough to generate the required employment in its wake, given the realities of population growth of the next two decades?

The Modeling Approach

To restate our objective in a slightly different way, we sought to find out whether growth in productivity, population, and economic development was balanced—or if imbalanced, whether they leaned toward increasing or decreasing employment prospects.

We were fortunate in having two excellent data sources available. The first set of data was derived from our project on Resources for Awareness of Population Impact on Development (RAPID), a continuing activity performed by The Futures Group under contract to the Agency for International Development. This five-year project is designed to improve the level of awareness and knowledge of high-level officials in developing countries concerning the effects of population factors on development. In this work, an analysis is conducted for each selected country, which determines the likely effect of different rates of population growth on the achievement of the country's development goals. Among the components of development that have been examined in detail for various countries are: labor force and employment, GNP and GNP per capita, agriculture, education, health, housing, urbanization, water, forests, and environment. These analyses form the basis of presentations to senior government officials in each country; the presentations include the use of color computer graphics and interactive computer models. The use of the computer permits us to make interactive changes during the presentation in response to questions from participants. A data base of information for over 60 developing countries has been prepared in this work and in-depth analysis is being conducted for more than 40 countries.

The second source of data was a data base constructed by The Futures Group known as GLOBESCAN. This data base contains historical, current, and forecasted demographic and economic variables for 140 countries. These data include: total population, population

by sex, population by age, population by urban rural residence, number of households, labor force, gross national product, income per capita, and income distribution. In addition, more than 100 other items are provided; these detailed data include economic structure and growth, trade, investment, debt, foreign reserves, exchange rates, and mineral and energy resources.

This GLOBESCAN data base is also a forecasting system. It is unique in the sense that it exists on a computer disk, for either the Apple II or TRS-80 microcomputer. The model allows the user to update the data, to change inputs and assumptions, and reestimate the forecasts that are contained as a baseline on the disk. For example, with this computer program a user may enter information describing a particular segment of the population and project the number of people in this segment. In order to investigate conditions in a particular country, a user might request that the program provide estimates of the number of all males between the ages of, say, 15 and 45, or all people with per capita incomes above $500. The model would then automatically produce such forecasts.

The GLOBESCAN system contains information from data files of other organizations such as the World Bank, the United Nations Population Division, and the International Monetary Fund. It also includes information not available in such sources gathered from the countries of interest themselves. Major advantages of GLOBESCAN are that it accumulates these data in a single place and treats data on a consistent basis; furthermore, since it is available within a single computer source, the data can be manipulated rather easily for statistical programs.

Description of the Analysis

In order to examine the relationship between productivity growth and labor force growth, we calculated several correlations using cross-country data for 124 countries for the period 1979–1980. Our goal was to relate changes in labor force and productivity to the state of development, as measured by GDP per capita. First, we determined the

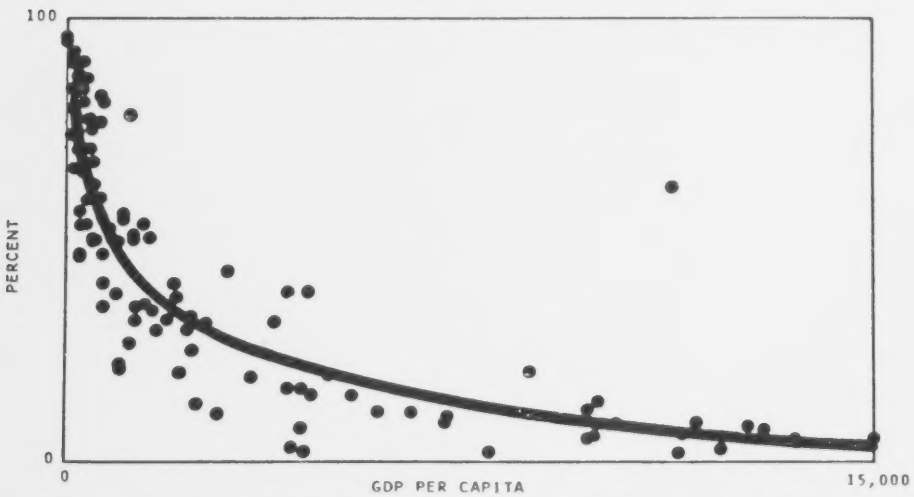

Fig. 1. Percent of labor force in agriculture vs. GDP per capita: $Y = 217.4 - 30.51 \times \ln(\text{GDP/CAP}) + 0.86 \times \ln(\text{GDP/CAP})^2$; $R^2 = 0.79$.

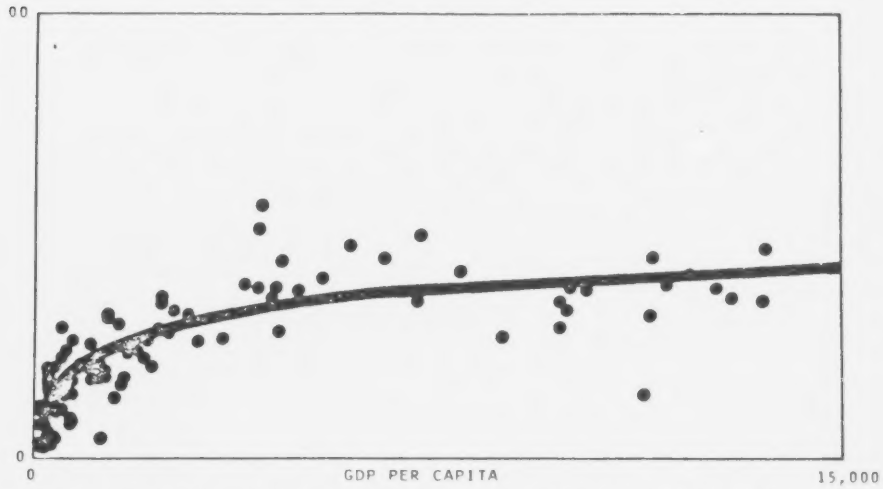

Fig. 2. Percent of labor force in industry vs. GDP per capita: $Y = -46.4 + 11.48 \times \ln (\text{GDP/CAP}) - 0.24 \times \ln (\text{GDP/CAP})^2$; $R^2 = 0.71$.

relationship between GDP per capita and the sectoral composition of the labor force. Figures 1, 2, and 3 show the percent of the labor force in agriculture, industry, and services as a function of GDP per capita. Figure 4 summarizes these results, showing how the labor force changes from almost entirely agricultural-based activities at the early stages of development to less than 25% of the labor force once GDP per capita increases to about $4000. The steepest decline appears to take place up to about $500 per capita.

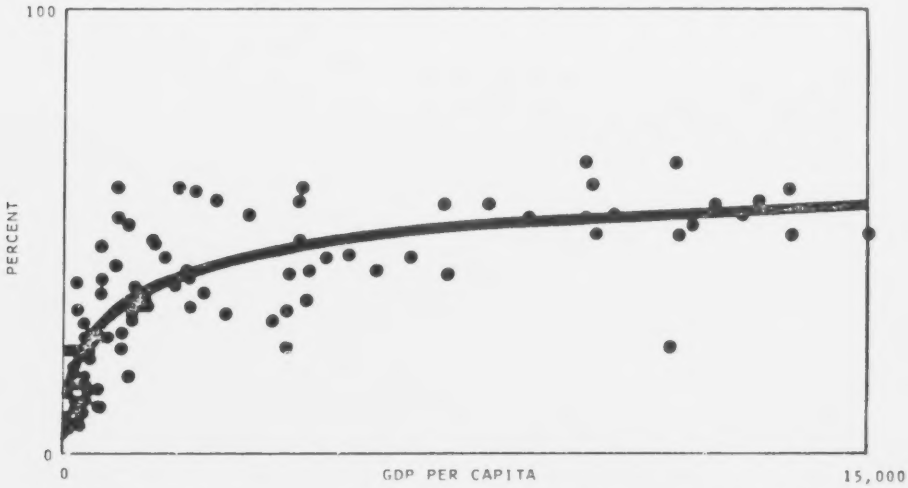

Fig. 3. Percent of labor force in services vs. GDP per capita: $Y = -71.7 + 19.19 \times \ln (\text{GDP/CAP}) - 0.62 \times \ln (\text{GDP/CAP})^2$; $R^2 = 0.68$.

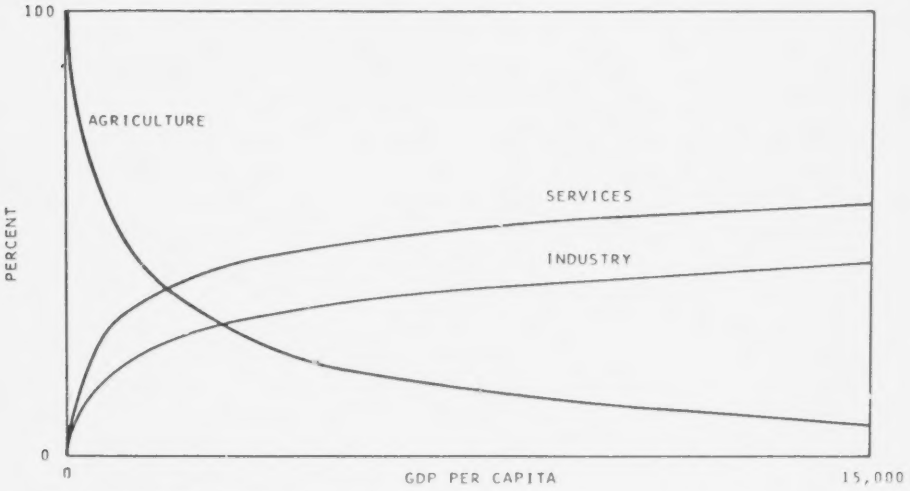

Fig. 4. Distribution of labor force vs. GDP per capita.

The changing composition of GDP by sector is shown in Figures 5, 6, and 7, and summarized in Figure 8. A similar pattern can be seen here. As a country develops, its industrial and service sectors form a larger and larger share of the total output.

The third piece of this puzzle is the change in labor productivity with development. Figures 9, 10, 11, and 12 show the relationship between GPD per capita and productivity

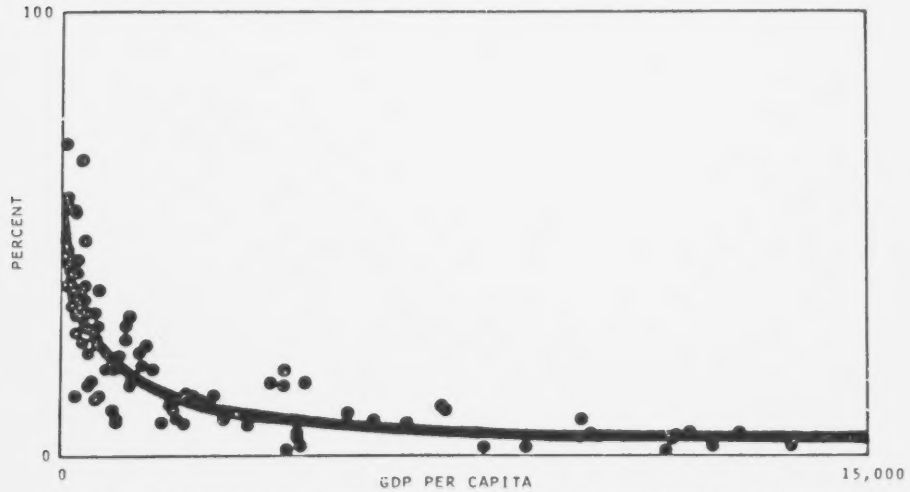

Fig. 5. Percent of GDP in agriculture: $Y = 193.1 - 38.26 \times \ln(\text{GDP/CAP}) + 1.93 \times \ln(\text{GDP/CAP})^2$; $R^2 = 0.77$.

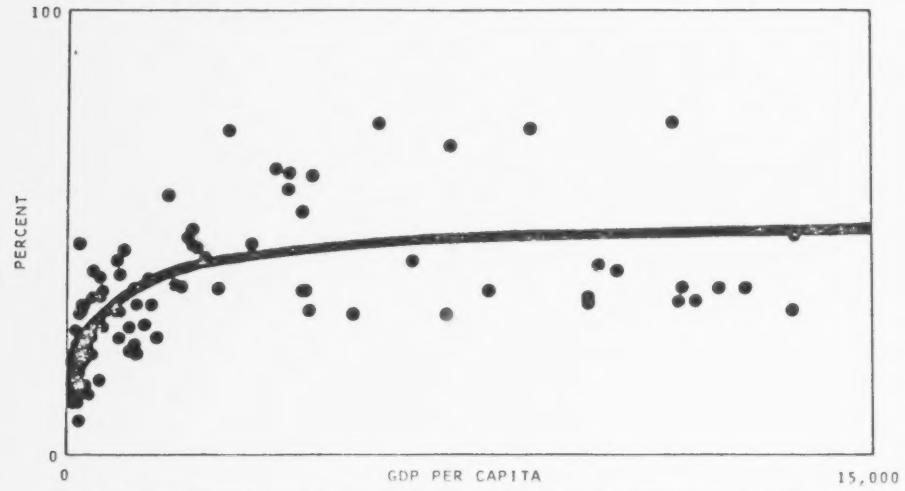

Fig. 6. Percent of GDP in industry: $Y = -79.2 + 24.28 \times \ln(\text{GDP/CAP}) - 1.13 \times \ln(\text{GDP/CAP})^2$; $R^2 = 0.49$.

in agriculture, industry and service. (Since data on employment are unavailable for most developing countries, the productivity shown in these charts is output per labor force participant.)

Using these relationships, we can investigate the changes that take place with development and their effect on employment. For any given level of GDP per capita we

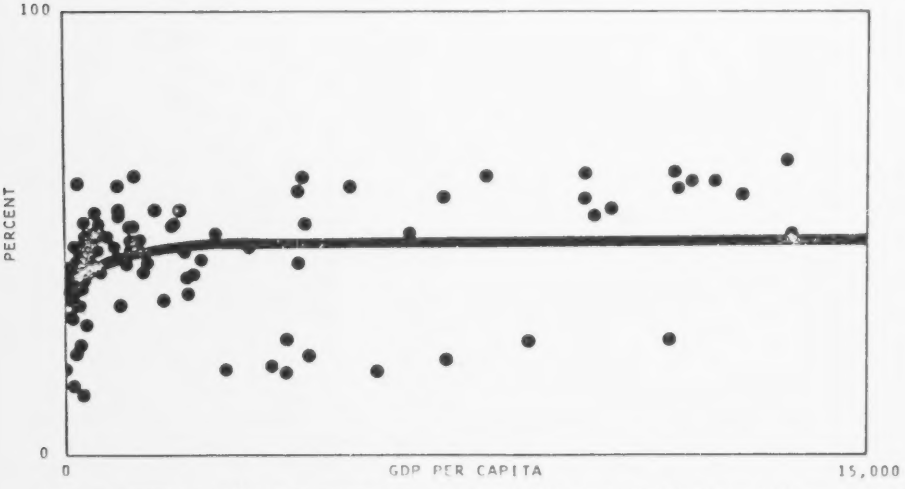

Fig. 7. Percent of GDP in services: $Y = -18.9 + 15.32 \times \ln(\text{GDP/CAP}) - 0.89 \times \ln(\text{GDP/CAP})^2$; $R^2 = 0.08$.

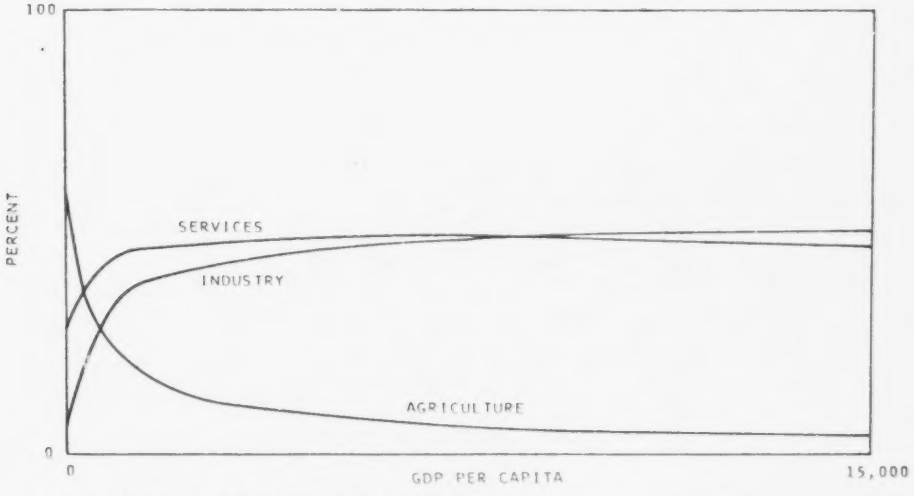

Fig. 8. Distribution of GDP vs. GDP per capita.

can calculate labor force productivity, the distribution of labor force by sector, and the distribution of GDP by sector. Then, for any given labor force size we can calculate GDP in each sector and, using the productivity equation, the employment by sector. Comparing this employment with labor force by sector results in the unemployment/underemployment estimates shown in Figure 13.

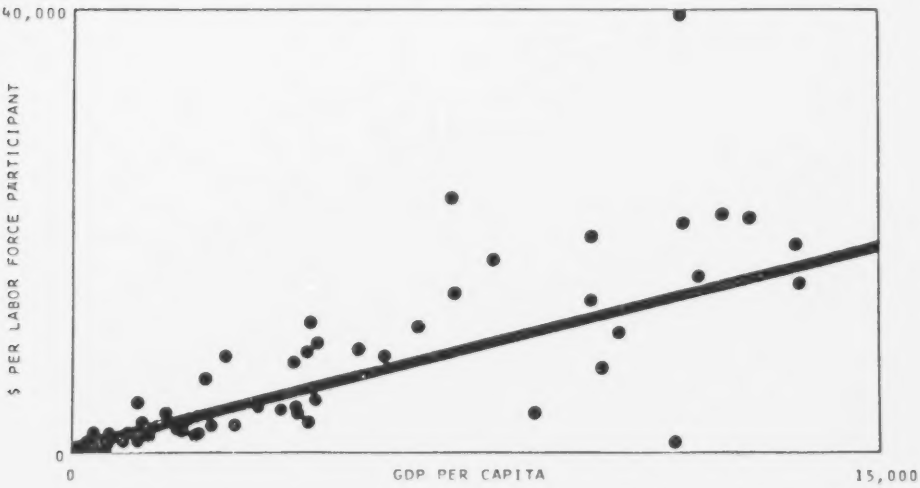

Fig. 9. Agricultural productivity vs. GDP per capita: ln (Prod) = 0.3628 + 0.9824 × ln (GDP/CAP); R^2 = 0.89.

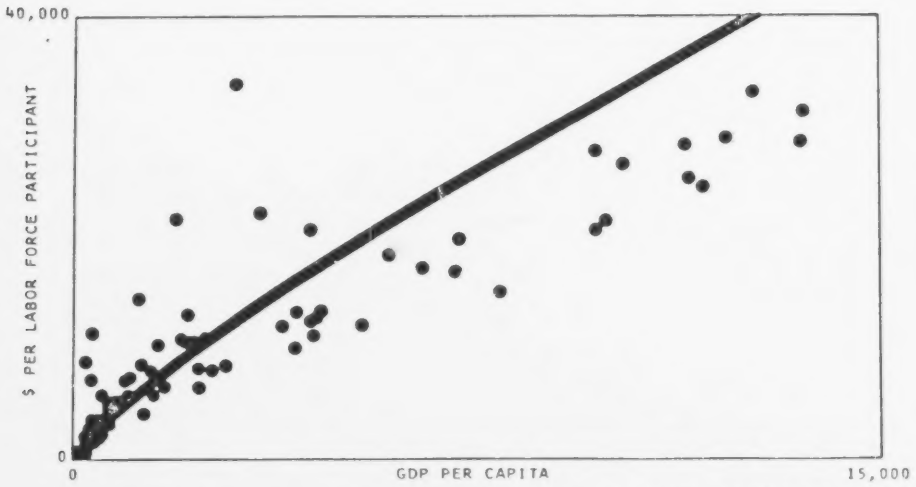

Fig. 10. Industrial productivity vs. GDP per capita: ln (Prod) = 2.6787 + 0.8374 × ln (GDP/CAP); R^2 = 0.82.

To be more precise, the regression equations shown in Figures 1–12 can be used to directly calculate the unemployment rate for a given level of GDP/capita. Using agriculture as the example we have:

$$\text{percent GDP in AG} = f(\text{GDP/capita}) \quad (1)$$

$$\text{percent LF in AG} = f(\text{GDP/capita}) \quad (2)$$

$$\text{AG PROD} = f(\text{GDP/capita})/\text{ IN AG UNEMP} \quad (3)$$

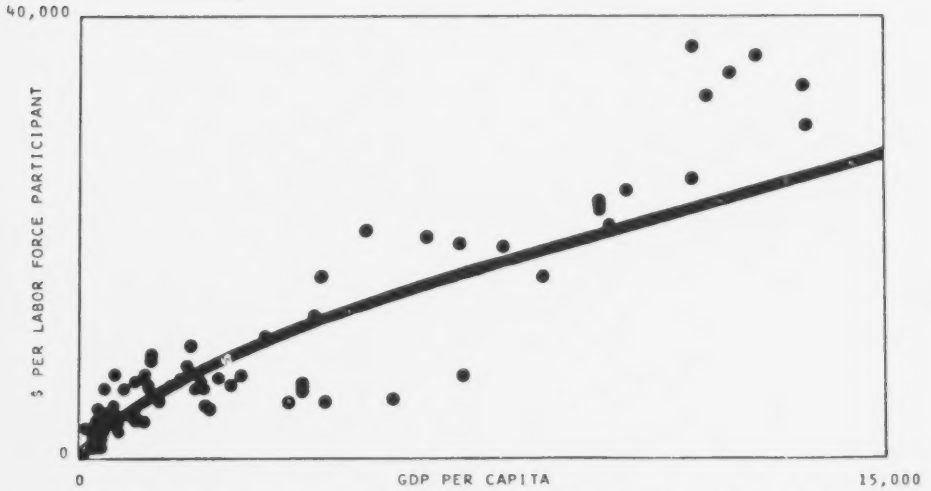

Fig. 11. Service productivity vs. GDP per capita: ln (Prod) = 3.7833 + 0.6671 × ln (GDP/CAP); R^2 = 0.82.

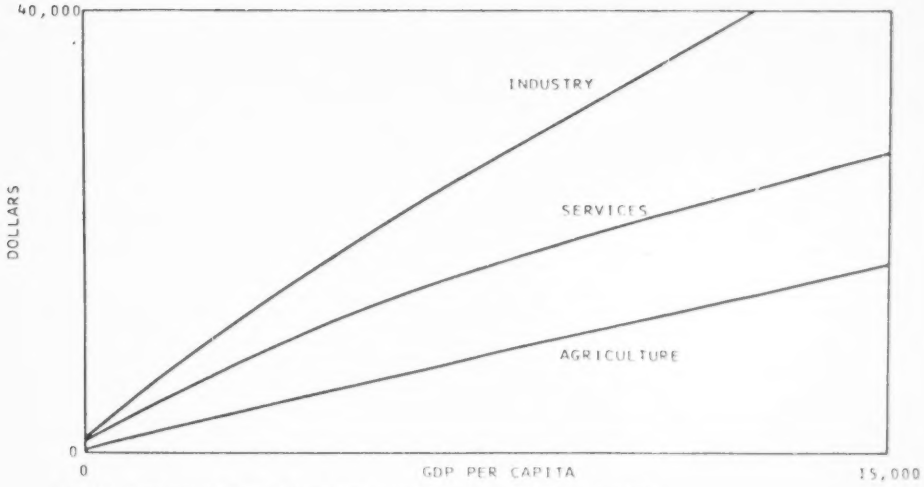

Fig. 12. Productivity per labor force participant vs. GDP per capita.

where

GDP/capita	=	gross domestic product per capita,
percent GDP in AG	=	percent of GDP in agriculture,
percent LF in AG	=	percent of LF in agriculture,
AG PROD	=	productivity in agriculture (output per worker),
IN AG UNEMP	=	initial unemployment rate in agriculture. (Since the regression equation was developed using output per labor force participant, some of whom are unemployed, it must be divided by the unemployment rate to yield output per worker.)

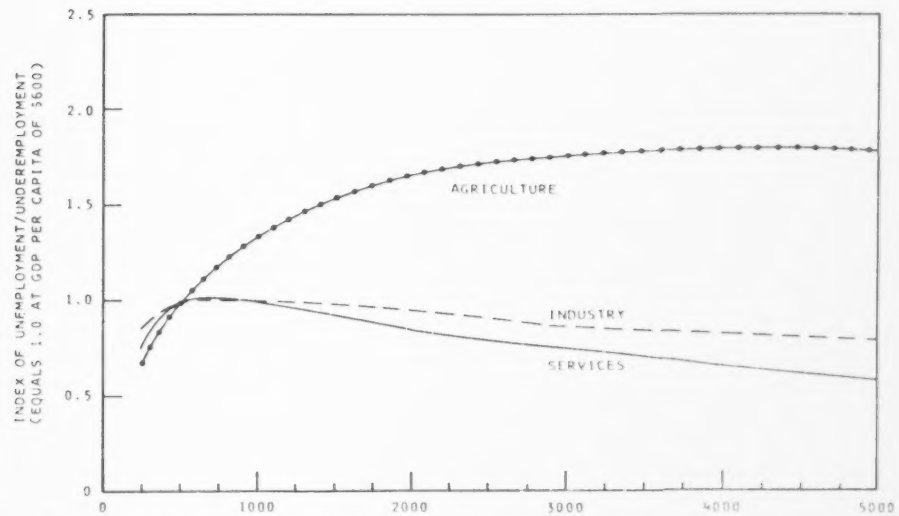

Fig. 13. Relative unemployment/underemployment by sector vs. GDP per capita.

Using these relationships we can calculate employment as output divided by productivity:

$$\text{EMP AG} = \text{GDP} \times (\%\ \text{GDP in AG})/\text{AG PROD}, \tag{4}$$

where

EMP AG = employment in agriculture,
GDP = total gross domestic product.

The total labor force is assumed to be the population multipled by the participation rate. The labor force in agriculture is the total labor force multiplied by the percentage in agriculture.

$$\text{AG LF} = (\%\ \text{LF in AG}) \times \text{POP} \times \text{PART}, \tag{5}$$

where

AG LF = labor force in agriculture,
POP = total population,
PART = participation rate (assumed constant).

The unemployment rate is one minus the ratio of employment to labor force.

$$\text{AG UNEMP} = 1 - \text{EMP AG/AG LF}, \tag{6}$$

where

AG UNEMP = the unemployment rate in agriculture

By substituting in equation (6) from equations (4) and (5) we have

$$\text{AG UNEMP} = 1 - \text{GDP/capita} \times \frac{(\%\ \text{GDP in AG})/\text{AG PROD}}{(\%\ \text{LF in AG}) \times \text{PART}}.$$

By specifying a level of GDP per capita, the entire right-hand side of the equation can be determined from equations (1)–(3). Thus, for each level of GDP/capita there is a corresponding level of unemployment.

In each sector we wanted to see whether the decline in the percentage of labor force in agriculture is sufficient to offset the increases in labor productivity. Figure 13 shows the change in unemployment and underemployment from the current levels, which are indicated by an unemployment/underemployment index of 1.0 at the 1980 average GDP per capita of almost $600.

In agriculture, productivity growth appears to occur faster than the shift of labor out of the sector leading to a steadily increasing rate of unemployment and underemployment. This is an interesting result because we know that migration from rural to urban areas—one of the major causes of the decline in the fraction of the labor force in agriculture—takes place only partly due to rising productivity. Certainly, many people leave the rural area because of a lack of steady employment or low wages. However, many young people

who might have found work in agriculture migrate because of the attractions of urban life, better living conditions, and more exciting things to do. It appears that even with this migration, increasing productivity wins the race and too many people are likely to be available in the agricultural sector.

The role in this transition of government policies that discriminate against agriculture is very complex and is not explicitly included in our simple model. For example, many governments have policies designed to keep urban food prices low. These policies often have the effect of depressing prices for farm products. This often discourages the farmer from making maximum efforts to raise yields or utilize the land to the fullest. While this may slow the pace of mechanization it may also act to keep agriculture employment low by underutilization of the land.

In the industrial and service sectors, we see a somewhat different picture. Up to GDP per capita of about $500 unemployment and underemployment increase; beyond that point they begin to decline. Since the most rapid decline of the labor force in agriculture takes place up to $500, it appears that the large influx of agricultural workers causes the industrial and service sector labor force to grow faster than employment opportunities. Arthur Lewis described this process: industry benefits during the early stage of development because it is able to draw upon a surplus pool of cheap labor from rural areas.[2] Apparently the attraction of these jobs with their higher wages initially draws even more workers than the sector can accommodate, although not enough to reduce underemployment in agriculture.

In order to examine the effect of these trends over the next 20 years we have constructed the simple model shown in Figure 14. This model uses the relationships discussed earlier and adds a new function relating the savings rate to GDP per capita. This relationship is shown in Figure 15. We have used this model to project the situation for all developing countries. Although such a gross aggregation hides the very different situations that are experienced by individual countries, it is useful to give some indication of general trends.

The steps in using this model are as follows:

1. Begin with 1980 values of GDP, population, and labor force participation rate for all LDCs.
2. Assume a GDP growth rate, a population growth rate.

For each year in the future:

3. Calculate the population

$$POP_t = POP_{t-1} \times (1 + \text{population growth rate}).$$

4. Calculate GDP

$$GDP_t = GDP_{t-1} \times (1 + \text{GDP growth rate}).$$

[2]W.A. Lewis, Economic Development with Unlimited Supplies of Labor, *Manchester School* XXII (1954).

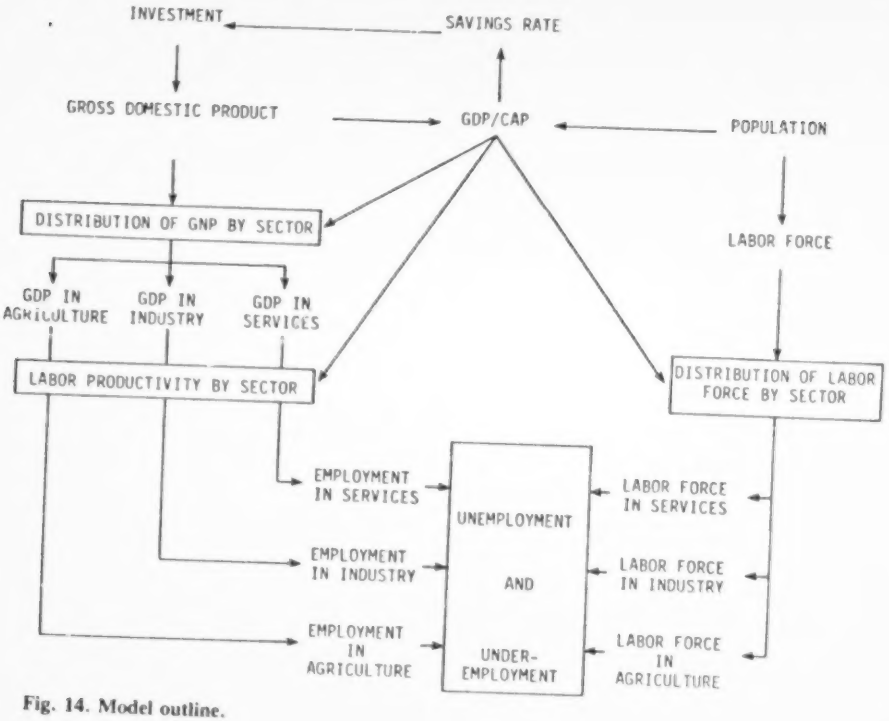

Fig. 14. Model outline.

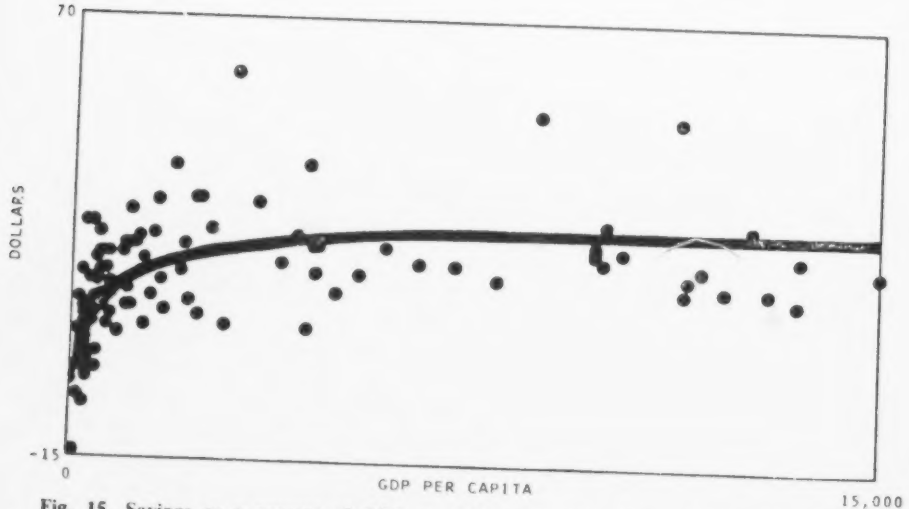

Fig. 15. Savings as a percent of GDP vs. GDP per capita: $Y = -83 + 23.41 \times \ln (GDP/CAP) - 1.22 \times \ln (GDP/CAP)^2$; $R^2 = 0.41$.

5. Calculate GDP/capita

$$\text{GDP/capita}_t = \text{GDP}_t/\text{POP}_t.$$

6. Calculate labor force

$$\text{LF}_t = \text{POP}_t \times \text{participation rate}.$$

7. Calculate the percent of labor force in each sector

$$\%\ \text{LF}_{\text{sector},t} = f(\text{GDP/capita}_t).$$

8. Calculate the labor in each sector

$$\text{LF}_{\text{sector},t} = \text{LF}_t \times \%\ \text{LF}_{\text{sector},t}.$$

9. Calculate productivity by sector

$$\text{PROD}_{\text{sector},t} = f(\text{GDP/capita}_t).$$

10. Calculate the percent of GDP in each sector

$$\%\ \text{GDP}_{\text{sector},t} = f(\text{GDP/capita}_t).$$

11. Calculate GDP by sector

$$\text{GDP}_{\text{sector},t} = \text{GDP}_t \times \%\ \text{GDP}_{\text{sector},t}.$$

12. Calculate employment by sector

$$\text{EMP}_{\text{sector},t} = \text{GDP}_{\text{sector},t} / \text{PROD}_{\text{sector},t}.$$

13. Calculate unemployment by sector

$$\text{UNEMP}_{\text{sector},t} = \text{LF}_{\text{sector},t} - \text{EMP}_{\text{sector},t}.$$

The average annual GDP per capita for all developing countries was about $600 in 1980. The average rate of population growth for these countries over the next 20 years is assumed to be about 1.9%/year. If we adjust the model to produce GDP growth of about 5.2% per year (the current World Bank projection) then GDP per capita would grow from $600 to about $1120 by the year 2000. In this case, we would see a 15% increase in the agricultural labor force, but only a 6% increase in agricultural employment, leading to an increase in agricultural unemployment of 40%, or 76 million people. The situation in industry and service is quite different; the unemployment rate decreases by 3% over this period. The industrial and service sector labor force grows almost 90% from 1980–2000, much more rapidly than the agricultural labor force, but from a lower base. The net result is an increase in the number of people unemployed by 60%, or 220 million people. Of course, most of these people will not be entirely unemployed, but they will be in a condition of severe underemployment.

Now suppose we look at the situation with an increase in the rate of growth of GDP

of 6.5% per year. In this case, development, as measured by GDP per capita, would proceed more quickly, reaching $1460 by 2000. The unemployment rate would increase even more in agriculture and decline somewhat more in industry and services. The net result would be about 7 million more unemployed by 2000. Thus, GDP per capita would be 30% higher by 2000 with this higher economic growth rate, while unemployment would also be higher, but only by 1%. If we reduce GDP growth to 4.2%, then by 2000 unemployment would be 2% less but GDP per capita would be 16% less.

As a second alternative, suppose we look at the case of even more rapid introduction of productivity-enhancing technology than has been the case in the past. The immediate effect on employment will be negative as more labor-saving technology is adopted. However, increased productivity should lead to higher incomes for those who remain employed. Since at low levels of income savings rates tend to rise with incomes, the net effect should be an increase in savings. Increased savings should lead to more investment and faster GDP growth. Will this faster GDP growth be enough to provide employment for those who lost their jobs because of the adoption of labor-saving technology? According to the model the answer is no. A productivity increase of 20% over the base case would lead, by 2000, to an increase in the savings rate of only about 2%. The result is a GDP per capita that is 1% larger in 2000 but unemployment that is 40% higher. These results are summarized in Table 1.

Thus, current trends indicate that the net effect of increasing productivity in the developing world is to increase incomes for those working but to decrease the percentage of the labor force that is employed. This increase in productivity per worker is the only way in which per capita incomes will eventually rise; however, it appears that, at least in the short term, increasing unemployment will be the cost of that development.

Figure 16 shows the labor force growth rates expected over the next two decades in many individual countries. The highest growth rates will occur in the countries of Africa and the Middle East, where growth of 3–4% a year is expected in many countries. These countries will be hard pressed to provide employment for the large numbers of young people entering the labor force each year. The situation should be less severe in many of the countries of Latin America, where labor force growth rates will be lower.

So, in summary, where does that leave us? Recognizing that the model we used is a vast oversimplification and that important country-to-country differences exist, our analysis suggests the following:

TABLE 1
Summary of Model Runs for All Developing Countries

Run	Assumption		1980	2000	Difference from Base Run
Base run	GDP growth = 5.2%/yr population growth = 1.9%/yr	GDP/CAP	$600	$1120	——
		unemployment	350	570	——
		(millions)			
High growth	GDP growth = 6.5%/yr	GDP/CAP	$600	$1462	+30%
		unemployment	350	577	+1.2%
		(millions)			
Low growth	GDP growth = 4.3%/yr	GDP/CAP	$600	$ 942	−16%
		unemployment	350	559	−1.9%
		(millions)			
High production growth	Productivity by 2000 is 20% higher than base case	GDP/CAP	$600	$1135	+1%
		unemployment	350	800	+40%
		(millions)			

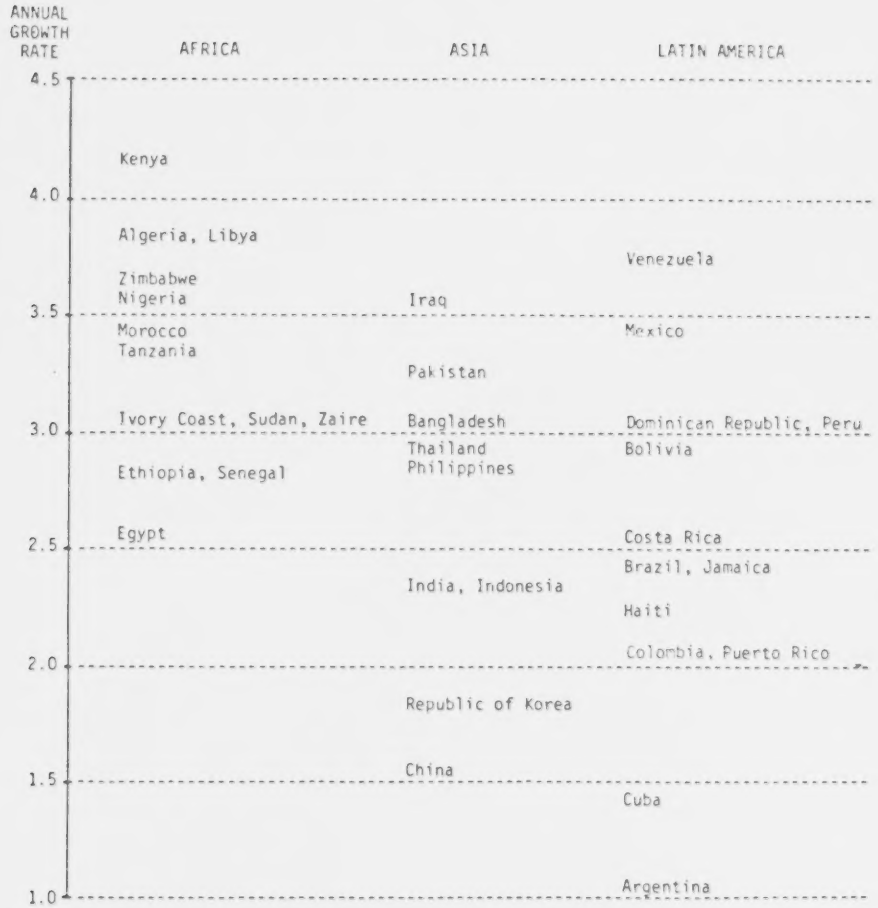

Fig. 16. Labor force growth 1980–2000. ***Source: GLOBESCAN II*** **(The Futures Group, Glastonbury, Connecticut, 1982).**

The current trends in productivity-related technology will lead to increasing unemployment in the agricultural sector. Although labor needs will be rising in other sectors, these needs will not compensate for the labor oversupply.

Economic growth targets and the policies by which those growth targets are pursued may have to consider employment effects more explicitly.

It may be necessary to make efforts to increase employment generation even if it slows the pace of development in order to reduce the extent of absolute poverty caused by underemployment.

New agricultural policies designed to maximize agricultural employment may be useful in many countries, not only from the standpoint of food production, but also as a solution to the looming problem of unemployment.

Without continued control of population growth rates, the situation will get worse.

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System Dynamics Group
Sloan School of Management
Massachusetts Institute of Technology
Cambridge, Massachusetts 02139

MANAGING THE NEXT DECADE IN THE ECONOMY

by
Jay W. Forrester
Germeshausen Professor of Management
Sloan School of Management
Massachusetts Institute of Technology
Cambridge, Mass. 02139

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MANAGING THE NEXT DECADE IN THE ECONOMY

by
Jay W. Forrester

The theme of today's conference is "The New Economy." We are indeed moving toward a new economy. But the form of that new economy will not become clear until about 1995. In the meantime, we will be busy extracting ourselves from the old economy and laying foundations for the new.

To understand more clearly present economic conditions, one should consider the overlapping effects of two different processes that are at work in the economy. First, is the ordinary business cycle fluctuation that runs some three to seven years between peaks. Second, is the economic long wave, which is also called the Kondratieff cycle. The economic long wave is a major rise and fall of economic activity that spans 45 to 60 years between peaks. It is a much larger and more important disturbance than the business cycle.

1. THE ECONOMIC LONG WAVE

You are all familiar with business cycles. But perhaps I should review the behavior of the economic long wave. The long wave consists of rising economic activity for two or three decades, then a broad peak some ten years wide, and then a major depression that can persist for a decade. After the depression, another long-term recovery starts. Literature on the economic long wave is filled with debate and conflicting assertions. Economic evidence has been interpreted differently by different observers. Because no theory of the long wave has existed to show how the many aspects of reality could fit into a unified pattern, controversy was unavoidable.

Some of us at M.I.T. have been drawn into considering the economic long wave through our work on the System Dynamics National Model. The National Model differs substantially from the more familiar econometric models. The National Model is built up from the operating policies within corporations and government, rather than from macroeconomic theory. It is derived from management policies as observed in the practical, working world, rather than

from statistical time series representing aggregate economic behavior. Without using external inputs from historical time series, the National Model generates, from interactions within its internal policies, the same patterns of change that have been observed in real life. The Model exhibits short-term business cycles of 3-to-7-years duration. It shows Kuznets, or construction cycles, of fifteen to twenty-five years in length. Under the appropriate circumstances, it manifests stagflation and reveals the cause of simultaneously rising unemployment and inflation. Also, from the interactions within the private sector and between the private sector and government, the National Model produces an economic long wave, or Kondratieff cycle, of 45 to 60 years between peaks. The National Model provides for the first time a cohesive theory to explain how a major rising and falling economic pattern spanning a half century can be systematically and internally created within an economy.

The long wave is an alternating over and under accumulation of capital plant. In Western industrial economies, capital investment has been concentrated in periods of economic excitement lasting about three decades. Such periods of aggressive new construction have been interrupted by major depressions occurring in the 1820s, 1890s, and 1930s. Now, after the expansion of the last several decades, we are probably entering another such economic downturn.

Along with overbuilding of capital plant go rising prices, falling productivity, speculation in physical assets, rising unemployment, and accumulating debts. At the end of the expansion, major imbalances have developed in the economy. Capital plant is overbuilt so that new investment is no longer justified until the old plant has been depreciated and worn out. People in the capital-producing sectors have completed their task of rebuilding the economy and must search for work elsewhere. Debts, which were taken on during expansion with the the expectation of rising prices and profits, become burdensome when profits decline and interest rates remain high. Banks must write off uncollectible loans. Speculatively elevated land prices must readjust downward to come into balance with salaries and wages.

2. IMPORTANCE OF THE ECONOMIC LONG WAVE

The interaction of these two economic fluctuations--the business cycle and the long wave--are far more important to understanding current economic conditions than are either economic ideology or changes in political parties. Current economic difficulties have been developing steadily for twenty years, regardless of changes in political parties. Similar economic problems now exist in most other countries, even those with very different political philosophies. New legislation is heatedly debated, but, when enacted, has little effect on rising unemployment and the growing excess of manufacturing capacity that has been steadily developing for 20 years. Business goes its way little influenced by Reaganomics, monetarism, Keynesianism, or supply-side economics. Each is a partial theory of economic behavior with little leverage against present economic circumstances. Under the surface, I believe there is something going on that is much more fundamental than the political issues now monopolizing debate in government and the press.

Over the last 20 years, the amplitude of the short-term business cycle has been steadily increasing. The last several recessions have been progressively more severe. We believe that the growing variation of the business cycle is a natural consequence of approaching and going beyond the peak of the economic long wave. In the 1950s and 1960s business cycles were restrained on the down side by excess demand and on the up side by shortage of manufacturing capacity. As demand has now leveled off and capacity has continued to expand, those restraints have been removed. Without the boundries imposed by pent-up demand and limited capacity, the business cycle peaks have become higher and the recessions deeper.

Business cycles are superimposed on the economic long wave. The center point of business-cycle fluctuation is carried up and down by the slow rise and fall of the economic long wave. To illustrate, one can think of the long wave as being like the rise and fall of tide in a harbor, on top of which business cycles are like the waves produced by wind. I believe that we are now past the economic high tide and that for the next decade the economic tide will be falling. Business-cycle recessions will become progressively deeper and each business-cycle peak will fall below the previous high.

One might wonder about the plausibility of a long downward move in economic activity while we are in an unexpectedly strong business cycle recovery. But the current recovery is consistent with the picture I have been describing. The business cycle can become larger when the economy moves beyond the long-wave peak. For a time, the short-term business-cycle recoveries can temporarily obscure a longer-term decline.

3. TRENDS FROM RECENT DECADES

To visualize the picture of business cycles superimposed on larger, slower changes from the long wave, consider six economic patterns of recent decades.

First, return on investment. For the last 20 years, return on investment for corporations has shown the ups and downs of business cycles superimposed on a continuing downward trend. The falling return is consistent with the growth of excess manufacturing capacity. Contrary to assumptions underlying recent legislative proposals, the country has too much manufacturing capacity, not too little. Policies to encourage investment are now ineffective because, in most industries, there is declining economic incentive to make new capital investment.

Second, productivity. Much concern has been expressed in politics and the press about the slowing of growth in productivity. But is such concern justified? Productivity has doubled since 1950. In the last several years, productivity has not been rising like it did, but why should that be cause for alarm? Productivity is now higher than ever before; it should support a higher standard of living than at any time in the past. And are the actions being taken to try to increase productivity reasonable? Government policy has tried to increase productivity by encouraging more capital investment. But more capital plant will do little to increase productivity when labor is already oversupplied with plant capacity. Productivity is leveling out, not

because capital plant is no longer rising, but because labor is already saturated with capital plant. At this stage in the economic long wave, more capital plant can do little to increase productivity.

Third, unemployment. Unemployment for the last 20 years shows a business-cycle fluctuation superimposed on a long-term upward trend that is being created by the long wave. Every peak of unemployment has been higher than the previous peak. Every low point in unemployment during business-cycle expansions has been higher than the previous low point. The present reduced level of unemployment is still above the last low point in 1979. The business-cycle fluctuations in unemployment are still being carried upward by the economic long wave. There was no change in the behavior of unemployment between the liberal monetary policy of the 1970s and the slightly more restrictive policy of the last few years. Political parties and Federal Reserve policy have had little influence. The behavior we have been observing during the last two decades is deeply imbedded in the economy and is more fundamental than anything that has been happening in Washington.

Fourth, government deficits. Government deficits have also been following a long-term trend independent of the political party in office. On the average, deficits have doubled in each four-year administration for the last five administrations.

Fifth, prices of agricultural land. For 35 years the price of farm land has been rising faster than the cost-of-living index. While the general price level has risen about threefold, the index of agricultural land prices has risen tenfold. For two decades land was seen as an inflation hedge, that is, its price was rising faster than inflation. People bought land to protect themselves against inflation, thus further driving up the price of land and creating still more incentive to buy land. Liberal monetary policies were holding interest rates artificially low so that the interest rate was much less than the inflation rate on land. By borrowing money to purchase land, the purchaser at the end of a year had more appreciation in land value than he had interest to pay. The borrowing itself created more money and therefore more inflation and, as a consequence, still more incentive to buy land. A liberal monetary policy fueled speculation in land values. But such a trend

of land prices rising faster than the general price level cannot go on forever. In time the price of land rose until it was too far out of balance with other prices in the economy. The imbalance became so great that in some areas the interest payment on a land purchase was several times the agricultural rental value of the land. Excessive land price is now beginning to be corrected. The official price indices for agricultural land show declines of ten or fifteen percent, but in some areas, land is this year selling for half the prices that were paid three years ago. On mortgaged land, farmer's equity is being wiped out and foreclosures are approaching the levels of the 1930s. As we move further into the downturn phase of the economic long wave, I expect the price declines of agricultural land to become more rapid and widespread.

Sixth, real interest rate. Another indication of long-run forces in the economy can be seen in the behavior of real interest rates. Real interest is the nominal bank interest minus the inflation rate. The National Model shows a relationship of real interest to the economic long wave that is strikingly like the real interest rate pattern that has been observed since 1930. The Model generates a fluctuation of real interest in which real interest becomes negative before a peak of the long wave, just as real interest did go negative in the 1970s. Immediately after a long-wave peak, the National Model produces a rapid rise in real interest, as has happened recently and as previously happened between 1930 and 1934. I believe that the present rising real interest rate should not be blamed on the current administration or on Paul Volcker and the Federal Reserve. Instead, present high real interest is part of the inherent dynamic of moving beyond the peak of long-wave expansion and into the down-turn.

4. HAZARDS FOR THE NEXT DECADE

We are now in a major transition between the economic growth that followed World War II and the economic growth that will resume again in the 1990s. The transition is a time of readjustment and a time for correcting imbalances that have developed within the economy. The transition is a time of technological change when many of the old technologies are laid aside and new technologies are tested and accepted as a basis for the next expansion.

The transition has historically been a time of economic depression, but the severity can certainly be made either better or worse depending on the wisdom of the economic policies that are adopted.

A depression period has traditionally started with a rapid deflation in the price of physical assets. In some parts of the economy, that has already been happening. Agricultural land prices are declining. Diamonds and gold have fallen by half from their peaks. Commodity prices have fallen. Housing prices were weak in the last recession and are subject to substantial correction in the future.

However, we believe that a physical depression, as indicated by high unemployment and underutilized capacity, can be accompanied by either deflation or inflation. Whether a country travels the traditional road of deflation or the less well understood path through runaway inflation depends on the action of government in controlling the money supply. Governments may increase money supply believing that more liberal money would reduce unemployment. But, under present circumstances, there will be little effect on employment or production from increase in money. If government attempts to buy its way out of economic stress by creating new money, there will be progressively accelerating inflation added to the unemployment. In Germany in the 1920s it has been reported that stores marked up prices four times a day in response to the changing foreign exchange quotations. As inflation accelerates, real economic activity grinds to a halt as more and more of everyone's time is devoted to coping with inflation itself.

If one must choose between a rapidly accelerating inflation or deflation, deflation would be preferable. It would run its course sooner and would lay a more solid foundation for rebuilding the industrial economies than would hyperinflation followed by calling in the money supply, reissuing currency, and starting the economy over again. We have not yet had time to use the System Dynamics National Model to search for policies that might find the narrow path between inflation and deflation. High priority should be given to avoiding both runaway inflation and a destructive deflationary spiral.

Even now, during a business-cycle recovery, high debts are becoming increasingly troublesome. In the next recession, debt loads will become far more burdensome. Foreign debts have so far received the most attention, but they will soon be joined at center stage by the U.S. Government debt, by mortgages on land, and by loans to weak industrial corporations.

Developing countries even now do not have sufficient margin in their balance of trade to make repayment of their debts likely. And, the next recession will reduce their financial solvency even further. Pressure to repay loans is already creating internal political forces that will lead to new governments that will feel no obligation to repay. The new governments of debtor countries will argue, with some justification, that the original loans were unwise on the part of the lender as well as the borrower, and that the lender was equally to blame. Eventually the only escape will be default. Loans subject to default equal more than the net worth of the entire American banking system. Reverberations from such defaults will shake the financial structure of the country and the world. Plans should now be made for how to handle such defaults to minimize the harm they could do.

But the United States Government is in much the same situation as the developing countries. U.S. Government deficits and debt are mounting rapidly. The pace of mounting debt will tend to accelerate in the next recession when tax revenues decline and demands for transfer payments go up. The U.S. Government is now borrowing money to pay the interest on past debt, just as are the developing countries. The interest added to principal raises next year's debt for which the interest payment will be still higher. Compounding interest into principal causes deficit and debt to explode. If we were to assume government revenues remain frozen at the present level and transfers and spending also frozen, with only interest payment growing, then, at present interest rates, the deficit will double each presidential term from the compounding effect alone. Such a runaway situation can only lead to some form of default on government debt. Unless deficits are immediately eliminated, there will probably be no turning back from default on U.S. debt. It is urgent that decisions be made now for a long-term resolution of the government debt question.

Banks will feel the full force of the coming economic storm. Banker's policies are at the center of the growing economic stresses. Even though most other economic actors have contributed to the economic difficulties of the next decade, the symptoms will become visible by way of the banking system. The public and Congress will apportion most of the blame to the banks. Just as in the 1930s, I expect that banks will be put back under severe regulation, the scope of their activities will be sharply narrowed, and their recently acquired freedom to operate outside their local geographical areas will be rescinded. It would be well to curtail this present last wave of excesses now running through the financial institutions and begin to return to conservative financial practices before action must be taken in an atmosphere of crisis.

5. HOPE FOR THE FUTURE

Although the bad news is that industrial economies seem to be headed for trouble, the good news lies in the paradox that our economies have never been stronger.

When, as at the present time, a peak in the long wave has been reached, industrial countries are capable of delivering a higher standard of living than ever before. More housing has already been constructed and is available. More labor is available. Ample production capacity exists to fill our needs better than at any time in the past. For 30 years industry has been building capital plant, thus increasing the output per worker. Productivity is now higher than ever before, even if it is no longer continuing to increase. How do we take advantage of the favorable position we have now achieved?

Social, political, and economic innovations are needed to reduce the hazards that lie ahead and to accentuate the strengths we now have. But can we be sure of choosing policies that will make the best of the situation? Too often, laws passed at times of crisis are either ineffective, counter-productive, or too late. Intuition and political compromise are not an adequate basis for dealing with the complexity of our economic system. But, there are now becoming available new and more powerful methods. One such is the System Dynamics National Model from which I have been drawing insights. It is now possible to handle more realistically how private-sector policies

and governmental laws interact, and to achieve a much improved understanding of how the economy operates. If we are to cope in the best possible way with growing economic stresses, there should be a national priority for quickly achieving a much better understanding of economic behavior.

We should reexamine our national priorities. The internal economic threat to the country is now far greater than the external military threat. Even so, the country does not strive for economic understanding with the forcefulness and adequate funding that are established patterns for military research.

It is time that seeking a better understanding of econ mic behavior should receive attention in keeping with its importance. Several major projects should be established, each with the goal of reaching within three years an improved understanding of how to avoid those policies that would make matters worse, and how to find the few high-leverage policies that will build on existing national economic strengths. I believe this is possible. We have only to attack the economic problems with the same vigor and dedication that we now devote to military projects.

A bright new economy lies ahead, but it begins about a decade from now. There is a swamp of economic difficulties to cross before reaching the rising ground on the other side. Many choices can be made in moving from here to there. Those choices will affect how smoothly we make the transition from the old economy to the new economy. If we simply react to pressures as they arise, we will continue to be dominated by forces for which we are unprepared. On the other hand, by coming to a better understanding of how economic forces are being created, we can begin to shape a more desirable transition into the new economy.

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The New Frontier of Job Creation

William Schweke

Program Director

Corporation for Enterprise Development

Speech at "New Economy Conference"

U. S. House of Representatives

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William Schweke

William Schweke is Program Director of the Corporation for Enterprise Development and Managing Editor of The Entrepreneurial Economy: A Monthly Review of Enterprise Development. He was formerly Director of Economic Development for the Conference on Alternative State and Local Policies, where he edited publications on resource taxation, plant closings and pension funds and co-authored Putting America Back To Work: What Cities and States Can Do and Community Energy Cooperatives. His most recent works are: The Role of Training in a Changing Economy, Planning for Worker Adjustment: A Technical Assistance Guide for States, and Expanding the Opportunity to Produce: Revitalizing the American Economy through New Enterprise Development. He is presently overseeing technical assistance projects in the states of Michigan, Ohio and South Carolina. Mr. Schweke is also a contributing editor of The Journal of Applied Behavioral Sciences and a member of The Commission on United States-Central American Relations.

The New Frontier of Job Creation

The American economy is showing increasing difficulties in supporting its people. The jobless rate is notching higher at the end of each recession, good jobs are becoming scarcer, and product life cycles are quickening. Macroeconomic policy, either of the liberal or conservative varieties, cannot effectively address those trends. So, a new development policy, focusing on entrepreneurship, is needed.

These are big issues. So, my task today is to treat these issues with a broad brush, outlining some of the symptoms of economic distress, analyzing a few of the economy's major trends, discussing the limitations of traditional macroeconomic policies and the need for a new entrepreneurial agenda, and proposing briefly some new options for federal action.

An Economy in Trouble

Although our economy also demonstrates tremendous strengths, there are numerous signs of economic distress and of increasing problems. The following are but a few of these symptoms:

- Though the jobless rate has varied with the business cycle--declining during expansions and increasing during recessions--it has increased two points each decade since 1950.

- Three fifths of families living before the poverty line had at least some members who worked every week of the year. One quarter of those families had at least one member who worked full-time, year round.

- Blacks comprise 12 percent of the U.S. population, but hold only about 4 percent of the nation's personal wealth. Most of this wealth is in non-income producing assets. So, these communities are still at a relative disadvantage in terms of utilizing the family, friends, and associates network to provide start-up capital for entrepreneurship.

- Since the mid-1970s, plant closings eliminated over 900,000 manufacturing jobs every year. Although this represents less than 10 percent of the manufacturing labor force, these displaced workers are concentrated in particular industries and, more importantly, in particular regions with relatively low rates of job creation.

- Important quantities of farmland are being converted to non-agricultural uses. Simultaneously, much of America's most valuable agricultural soils are eroding faster than replacement takes place.

- Surface waters are oversubscribed and ground water is being "mined" in some of the nation's most productive farming regions and fastest growing urban centers.

- Absolute productivity levels are now higher in several European countries than in the United States, and Japan's levels of absolute productivity will probably pass ours in the next few years.

- Between 1948 and 1966, real GNP growth in the United States averaged 4 percent, from 1967 to 1973 it was 3.7, and from 1974 to 1982 it was 2.2 annually.

- The United States now has around a $120 billion annual trade deficit.

A Changing Economy

Most policy analysts agree that the United States is in the midst of a profound and wrenching economic transformaton. The economic landscape is being altered by four major shifts: from an industrial to an "informational" economy; from an insular national economy to an interdependent global one; from a cheap and abundant supply of national resources to an expensive and constricting supply; and from a rapidly expanding labor force to one with a slow growth rate and a changing composition.

Whether these transformations will cause widespread hardship and declining living standards for American citizens is an issue of intense national debate. Those who doubt their negative impact recall the

"phantom" automation crisis of the 1960s, when it was predicted that new technology would render millions of workers unemployed--a crisis that never materialized (until the 1980s!). Others argue that todays' technological revolution will severely hurt certain groups of workers--particularly in declining industries.

Yet, we can still make some broad generalizations. We know that the U.S. economy is undergoing a dramatic shift from a reliance on manufacturing to service industries, particularly information services and those using advanced technologies. Between 1970 and 1980, 19 million new jobs were added to the U.S. economy; 95% were in the service sector. Meanwhile, closings of the branches of larger firms eliminated over 16 million jobs between 1976 and 1982 (almost one-third of these were in the manufacturing sector). Even the buoyant California economy was not exempt from these trends, as it lost more than 95,000 manufacturing jobs in in-state manufacturing closures between 1980 and 1983.

Furthermore, during the last decade, job creation and job loss were not uniform across all states. Areas of high unemployment correlate to a large extent, with areas that have had a high correlation of manufacturing employment. The belt of older industrial states the Northeast and Midwest were hit especially hard.

And although there are great disputes about the particular figures, it is expected that these shifts in our economy will accelerate in the 1980s. By 1990, the National Commission on Employment Policy projects that 72 percent of the labor force, over 89 million workers, will be employed

in service-producing industries.

Related to the "decline" in manufacturing is the increasing interdependence of the United States and other world economies. The U.S. lead in manufacturing was founded on industrial processes which produced quantities of standardized products. But today the edge is with countries that can produce the same--or higher quality--goods more cheaply. U.S. produced autos, steel, tires, and consumer electronic equipiment, for example, are increasingly losing out in the world market. Even computers and other "high-tech" equipment are facing stiff foreign competition in both their development and manufacturing. There is concern that Japan will be the first in the market with the next generation of computers, and the move of Atari from California to Asia, with the loss of 1,700 production jobs, has been widely seen as a grim harbinger.

There is considerable disagreement over whether the U.S. should try to regain a competitive advantage in traditional industries or shift into other areas. Likewise, there is also a great debate over the impact of these changes on both American consumers and workers. However, the important point is that we live in a new, more volatile world economy, where fully 75 percent of all goods produced in this country are now subject to international competition, up from 25 percent two decades ago. (And much of this new competition is subsidized by foreign governments.)

The economics of natural resources is also changing drastically. Resources once cheap and abundant are becoming increasingly scarce. The most dramatic example is petroleum, but new economic shocks are predicted in other areas, too, such as water.

Increasingly limited supplies of natural resources raise the spectre of conflicts between environmental quality and conservation on one hand, and jobs and economic vitality on the other. However, resource constraints can also spawn new industries--resource management, renewable energy, new conservation techniques, waste recycling, sustained yield agriculture and forestry, for example. It can be argued that sustainable economic growth in an age of declining natural resources must be based on prudent resource management, and that neglecting these issues will undermine other efforts at economic security. And in fact, the alternative energy industry could be one of the fastest growing of the 1980s, with conservation leading the way. According to the investment firm of Hambrecht and Quest, we can expect the industry as a whole to grow over ten-fold, to a $50-60 billion level, by the 1990s, as companies in the industry reduce system costs and identify site-specific applications compatible with renewable energy sources.

Basic demographic changes, economic factors and the accelerated movement of women into the workforce will have substantial effects on labor supply during the 1980s. These are the major trends:

- The labor force will grow more slowly. The projected growth rate of 1.5% in the 1980s is about half that of the 1970s. This is primarily due to the decline of young new entrants--the baby boom population bulge has already moved into the workforce.
- The labor force is aging. The U.S. population in the 16-24 year age range peaked in 1980, with about 26 million in the labor force. By 1990, that number will have declined to about 24 million.
- The share of minorities entering the labor force is increasing. Minorities will represent 20-25% of growth during the 1980s, compared with 10% during the 1970s. While the number of 16-24 year old in the labor force is expected to increase by about one percent for blacks and other minorities.
- The percentage of women entering the labor force is expected to grow, although at a slower rate than during the 1970s. Of a total 18 million persons projected to enter the labor force during the 1980s, twice as many will be women (12 million) as men (6 million).
- Finally, the labor force is becoming better educated--at least in terms of years of schooling completed. However, because occupations requiring a professional degree did not grow rapidly enough to absorb them, about 1 in 5 graduates took jobs that did not require a degree for entry. The Bureau of Labor Statistics reports that a surplus of betwen 2 and 3 million college graduates is expected to enter the labor force during the 1980s.

The Limits of Macroeconomic Policy

Neither Democratic nor Republican macroeconomic policy has effectively addressed these trends. Instead, many policymakers have responded with rationalizations (e.g. the "natural rate of unemployment"), palliatives (e.g. income maintenance), or blind hope (e.g. "wait for the recovery to take hold").

Indeed, there is a "natural rate of unemployment" -a rate below which unemployment cannot be reduced without triggering rapid inflation through conventional macroeconomic stimulation. But, I am convinced that the unemployment rate barrier is a reflection of the limits of macroeconomic policy, not the limits of the economic capability of the American people.

Both traditional Keynesian macroeconomic policy and the new "supply side economics" essentially assume flawless microeconomic functioning in the economy. John Maynard Keynes was explicit about this assumption; productivity would be taken care of by businessmen given the right (macroeconomic) demand policies.

Though its title suggests the contrary, supply-side economics is even more premised on the assumption that private markets act perfectly. Macroeconomic policy must simply shift demand from the public sector to the private by cutting taxes and otherwise minimize public interference in private market function. As Felix Rohatyn put it: supply-side

economics is simply Keynesianism in drag. I believe that the exclusive focus on public funding levels misses the point.

All of which is not to suggest that appropriate macroeconomic policy is unnecessary, but rather that it is, in itself, insufficient. Abundant theoretical and empirical evidence suggests that markets -like all other human institutions do not function perfectly. Investment does not always flow to areas of highest return (controlling for risk). In particular, seed and equity investment is often unavailable to those new, young and growing businesses which are creating most new jobs, introducing most innovations, hiring most new labor market entrants, and offering high returns on investment. Investable assets are becoming increasingly concentrated in large institutions which find it difficult and costly to make long-term investments in small deals, and are by habit and regulation trained to be excessively risk averse. Labor markets are similarly imperfect: information on job openings and available skilled labor is fragmented and expensive; financing for the acquisition of new skills is often unavailable, even as skill requirements increase and change with greater rapidity; rewards for skill acquisition are often uncertain and low in a loose labor market; the income maintenance system often introduces disincentives for labor force participation; management practices and the threat of technological displacement often inhibit labor productivity. Technological innovation is impeded by lack of investment in R&D and new ventures, research biases of engineers and scientists, lack of effective demand to follow need, and gaps between academia and the marketplace.

Of course, markets have never been perfect, but the cost of such "market failures" has been multiplied by our need to adapt to fundamental economic transformations. There is no guarantee that the reduction of market failures will create all the new industries we require, produce an adequate number of jobs, include all the groups who find themselves on the margin of the economy or provide adequate income levels. But if we do not act to reduce them, surely we are less likely to achieve any of these goals. What is needed is economic development--changes in the process and structure of production, qualitative changes -not just economic growth, that is, changes in the quantity of production. Therefore, both the vitality and the equity of the American economy depend on making it less difficult to bring new people and products to the marketplace. We must insure that an individual, whatever his or her background, with an idea of how to do something better has access to the tools he or she needs--capital, training, technology--to take that idea to the marketplace. Or, in simpler terms "we must give more folks a chance at bat."

I will call this an "entrepreneurial policy".

It is largely through the development of new enterprises that economies adjust to change. Evidence of that is now legion. Business formation rates have increased in step with increasing economic dislocation and the rise of new opportunities in the economy from 90,000/year in 1950 to 250,000/year in 1970 to nearly 600,000/year in the 1980s. The findings of David Birch at MIT and Katherine Armington and Marjorie Odle at the Brookings Institution who have done the most extensive research in the

areas, agree with the finding of less ambitious studies using different data bases, that independent entrepreneurs are creating most new jobs in the economy. Young and small firms are the chief pioneers of new products and services. They are showing excellent returns on investment. And they are the entry way to the economy for labor market entrants and marginal groups: 60% of entrants gain their first job in small firms; women-owned businesses are increasing at three times the rate of male-owned businesses; and the creation of new ventures and the expansion of young firms are one of the few promising paths for development in depressed communities. Studies of the best performing large firms in In Search of Excellence and other works now point to intracorporate entrepreneurship as one of the keys to their continuing high performance.

I do not use the term "entrepreneur" or "entrepreneurship" in the individualistic heroic, macho and high-tech sense, which it is so often discussed. To do so would be to distort the phenomenon and undermine its potential. While forming a new enterprise is a necessarily risky and difficult undertaking, it need not be--and in terms of economic efficiency should not be--as difficult, or heroic as it is. To conceive of the prototypical entrepreneur as a white male entrepreneur is also too narrow a conception. Women, minorities and the disadvantage offer unrealized entrepreneurial potential. Indeed there is no evidence that entrepreneurial capacity correlates with income level; on the contrary, as George Kanahele states the matter:

"Entrepreneurs do not usually come from the cradles of soft, rich living; they often come from the pits of disaffection, rebellion, and

They are people who have lost their jobs, or are in a low-pay, dead-end job, or who have so many jobs that they never want to work for anybody again."

Finally, entrepreneurs are not only those people who start [illegible], for profit businesses, but non-profit enterprises (which constitute greater than one fifth of the economy and provide real value in every corner of the world), and new ventures of larger institutions, private and public.

The Limits of an Entrepreneurial Economy

Recognizing the potential of enterprise development requires that we honestly face its limitations. As critics are quick to point out, many small and young businesses close, the quality of the jobs they create is often quite poor, and increased entrepreneurship and technological change can wreak havoc with mature industries, older workers, and many communities.

Indeed, one percent of the businesses in the United States fail each year (close with a loss to creditors), and most of these tend to be young businesses. A larger number close without loss to creditors, and though our statistics on closure rates are quite dated and very poor, the most probable rate is eight percent a year. But these business closures are not total losses; during the time they exist, these businesses employ people, produce products, and generate income. Moreover, the difference between growing and declining communities is not their business failure rate (which is remarkably constant across the country) but rather their formation rate.

The low quality of the jobs created by small, new businesses is a more serious problem. Many small businesses pay less than their larger counterparts, tend to be nonunionized, and offer few benefits. But low job quality is not a problem of small, young, or new businesses alone; it seems to be characteristic of some occupational tiers in much larger organizations. Moreover, the experience in small and young businesses is not uniform, with some offering quite well-paying jobs with good benefit packages. But on the whole it remains the great unaddressed question in this economy--a question much larger than simply that of new and young businesses.

I also do not underestimate the social costs of the economic restructuring and entrepreneurial risk-taking required by our time. As new ventures are launched and new technologies are commercialized, plant closings and layoffs will occur. Policy measures are needed to alleviate the short-term harmful effects of rapid economic change and to prepare the workforce for the upcoming cycle. Indeed, this is a necessary piece in fostering a more dynamic and innovative economy.

But here, too, entrepreneurship is relevant. Our basic industries must become more modern, more productive, and more entrepreneurial.

In addition, a comprehensive economic adjustment strategy is not simply a training policy or a means of responding to plant shutdowns. It is also a fundamental tool for increasing the capacities of communities to forge their economic futures, to integrate state, federal and local resources, and to mesh employment programs with economic development efforts.

Hence, I take each of these problems as challenges which a more effective development policy must answer better, not as an argument for ignoring the potential such a policy offers.

Guidelines of an Effective Policy

An effective entrepreneurial policy must include the following six characteristics: (1) It must be carefully aimed at the barriers to entry and expansion faced by new, young and growing enterprises. The needs of those businesses are distinct: they need equity not debt, and they cannot take advantage of business tax incentives, for example. (2) It must necessarily be indirect and systemic since it is impossible to cut individual deals with hundreds of thousands of fledgling entrepreneurs. (3) If it is to be even a partial answer to unemployment, it must be able to generate tens of thousands of jobs on a state level and millions on a national level. (4) It must be cheap and rely either on redirecting existing public expenditures or private capital flows. These conditions are dictated both by the magnitude of the resources required, current constrictions on government budgets, and the absolute necessity of conserving and increasing government investments in education and services that are crucial to cultivating a self-sufficient population. (5) It must be market-sensitive, designed to engage the energies and initiative of a large number of people and institutions but without pretending markets are perfect. (6) It must address the range of public policy from income-maintenance and social-service policies to employment and economic policies.

It is important not to fall prey to the mythology about public and private that abounds. Private is not always efficient and public is not always wasteful and lethargic. Nor are public and private sectors, separate and independent. In fact, thinking about them in that way prevents market-perfecting strategies which could expand output and jobs, and confines public economic activities to bureaucratic and marginal activities. We live in a single economy, partly public and partly private, where the real question is how can the sectors most productively interact to optimize the achievement of public and private values.

Moreover, properly designed entrepreneurially-oriented developent programs should be viewed not as mere expenditures of taxpayers dollars, but as investments in the citizenry's future prosperity. Government should be investing in new ideas through its research and development efforts; in its people through its education and training programs; in its businesses by increasing access to capital; in public works by assessing the infrastructure needs for an evolving economy and by putting a long-term capital planning and budgeting process in place; and in its natural resources through its efforts to insure the sustained productivity of renewable resources while securing a healthy environment.

Entrepreneurial policy also requires a genuine belief in the ingenuity of the American people. There is no way of assuring this except by making sure reasonable access to the necessary support and investments exists.

A New Agenda

At the core of entrepreneurial policy are changes in eight basic areas:

- Stimulating seed and equity investment in new and young firms, and long term, fixed-rate debt to growing firms by altering the regulation and behavior of private financial institutions, developing new institutions and instrumentalities to provide risk capital, and stimulating and channeling individual business investment.

- Gearing training and education programs toward activities with strong built-in job securing or job creating strategies like entrepreneurial training.

- Using economic adjustment programs to aid dislocated workers and communities, but also to create proactive strategies to preserve and create jobs.

- Revising income maintenance policies so that they not only mitigate the pain of dependency, but also support and encourage training, work and job creation.

- Increasing research and development investments oriented toward new business commercialization.

- Building up the entrepreneurial, managerial and developmental skills of public and quasi-public institutions, nonprofits, DCDs, cooperatives and employee-owned firms.

- Developing community economies by building a network of activities, not single projects.

- Improving job quality by fostering employee ownership, labor-management committees and developing other more effective strategies.

First Steps Toward a National Entrepreneurship Agenda

Developing a national entrepreneurial agenda, which meets these criteria, will take at least a decade, involving policy measures in a wide variety of areas from research and development policy to human capital programs. In addition, policymakers must craft very different measures if they are to address the quite specific problems of older industries versus the new entrepreneurs. For example, trade reforms, new labor management structures, employee ownership, tax reform, new incentives for fostering intra-corporate entrepreneurship, and many other tools must be utilized to make our mature sectors more competitive. On the other hand, new and young independent firms face, among others, critical problems of capital access--often capital is not available in the right amount and the right form.

So, for the conclusion of my talk, I am going to focus solely on the free-standing entrepreneur and describe a newly introduced piece of legislation, H.R. 4718, which I have contributed to and which takes some beginning steps in this direction. Congressman Charles Schumer's (D-NY) bill builds upon recent exciting precedents from the states in the field of economic development. The legislation has four parts and would

establish a secondary market for industrial mortgages, state pension investment units, state venture capital and royalty finance corporations, and a national loan loss reserve fund.

Secondary Market for Industrial Mortgages

To increase the small and medium sized firms access to long term capital for expansion and modernization of their capital stock, a national program to insure packages of multiple loans, akin to residential backed securities, would increase the access of small and medium sized firms to long term financing for expansion and modernization of their capital stock. Such a program should cover small and mid-sized firms long term equipment and plant loans. The originator (commercial finance companies, banks, etc.) would individually assemble a number of separate business loans under some precommitment of federal insurance authority and perhaps private insurers. A servicing fee would be given to the originator, and the various parties bearing the risk would each receive a proportional share of the risk premium, also paid by the borrowers. Shares in the pools would be purchased by institutional investors like pension funds. An appropriation of $200 million should leverage approximately $4 billion in private dollars. (Another earlier version of this bill is in H.R. 4360, which has been voted out of the House Banking Committee.)

State Pension Fund Clearinghouses

One of the major obstacles to redirecting public and private pension funds to entrepreneurship is the absence of a public-spirited development broker which could lower the administrative costs of making such investments. The federal government should provide matching grants to states who wish to establish pension investment clearinghouses. Such units could collect and disseminate information on new investment options, design demonstration projects, recommend policies and legislative changes, development alternative mechanisms for investment, and make it possible for pension fund managers and trustees to confer regularly and coordinate their strategies. A small investment of federal dollars here could help to leverage tens of millions in new investment capital. California's Pension Investment Unit, for example, used its $400,000 budget to design investment strategies for beginning to move almost $900 million into new in-state, but prudent, housing and business investments. A total federal appropriation of $25 million over three years, could direct at least $3 billion into more entrepreneurial investments like venture capital, over-the-counter stock, small firm equities, SBA guaranteed loans, direct placements, and so on. (In fact, if only .5 percent of public and private pension assets were in such investments, they would total $40 billion.)

Matching Grants for State Development Finance Corporations

A number of state governments have created in the last few years

tive new financial corporations for leveraging capital at new product development, employee ownership, minority entrepreneurship, and enterprise development in economically depressed areas. A matching grant program would be designed to spur the replication of successful state venture capital corporations and stimulate experimentation with new and more effective models along the lines suggested by the last decade of experience. A federal appropriation of $250 million over five years could leverage an equal amount of state monies and at least 3:1 in private investment for a total of at least $1.5-2 billion.

Loan Loss Reserve

A National Loan Loss Reserve Program would address the unmet capital needs of rapidly growing small and young businesses whose growth exceed their ability to generate internal resources to finance their expansion. The program works by authorizing banks to make loans to firms under $25 million in sales. The borrower and the lender agree on a loss reserve rate and each contributes one-third of the reserve. The minimum rate is 1 percent and the maximum is 5. The government then contributes an additional amount equal to the firm's contribution. This yields a loss reserve of 3 percent minimum and 15 percent maximum on each loan. Each bank develops its own loss reserve and can draw money from that fund only by experiencing losses. Losses are paid 100 percent if the reserve is adequate and since each bank has its own reserve, it is in its vested interested to keep losses to the minimum. But as the reserve grows, the bank can afford to be more aggressive in its lending practices.

Such a program opens up a new market for the SBA, cuts red tape, paperwork and delays, and should encourage a large lending volume at a fraction of the costs of the SBA guarantee program. A federal appropriation of $200 million should leverage approximately $4 billion in private capital.

Conclusion

Federal government investments in these areas will leverage additional millions of private sector dollars, creating thousands of enterprises and tens of thousands of new private sector permanent jobs. This is the new frontier of job creation.

Business International Corporation

THE GLOBAL ENVIRONMENT FOR US MULTINATIONAL COMPANIES

Presentation
by
Orville L. Freeman
Chairman of the Board
Business International

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US companies, as they look out beyond their borders for new markets that will help sustain their home base of operations, face a far different world from that which laid before them at the end of World War II. At that time, US business, feeling the overwhelming industrial muscle that had helped win a two-front war, had little overseas competition to contend with. Europe was in ruins; Japan and Germany, former industrial powerhouses, were vanquished enemies. Simply put, the rest of the industrialized world, while expected to come along rapidly, was not yet ready to compete.

Other factors favored US companies in that early period of the '50s and '60s:

Overseas markets were plentiful. War-ravaged countries had to be rebuilt and this required massive infusions of capital goods and equipment as well as consumer durables and non-durables until the affected areas could supply themselves with these needs. Many developing countries, flush with earnings from supplying the war effort, were eager to spend it on goods and services as well as to build their own basic industries.

The war had seen major breakthroughs in technology that the eagerly awaited peacetime use and broad consumer application. Much of this technology was American in origin. What's more there was a

spirit of entrepreneurship among many of the millions of returning veterans, whose horizons had been widened beyond their hometowns, and who felt that they could meet any challenge in the quest for a better lives for themselves and their families.

The global environment was basically a stable one for doing business. The rules of international trade had been carved out under the aegis of GATT, and the process of reducing tariffs and other barriers to trade already had begun. Too, the US dollar reined supreme in an orderly monetary system in which virtually every currency movement could be predicted; there were few surpises lurking in the realm of global finance.

The forces that shape the movement of capital and goods, and that govern competition among nations have very much changed. They do not favor US companies as they once did. World economic growth, while at present in a state of recovery, is not expected to be sustained. This will force governments to seek ways of isolating their economies from global stagnation. Barriers to imports continue to plague firms that dare to ship goods across national borders. Interest rates are again climbing to discourage capital expenditure on plant and equipment that could underpin continual economic vitality. Unemployment persists encouraging governments to adopt measures that strain government budgets and that lead to industrial policies that distort competitive advantage through hasty subsidies.

In order to be able to assess the ability of US industry to compete and the role government funding and policies can play in helping companies develop and use the technology necessary to

sustain our world position, we must understand these new forces. Below, I have outlined a number of key considerations regarding the changing global environment that we should bear in mind during our discussions today.

A different, difficult world

US companies are not alone in their concern for the changing and unstable rules of the game. The difficulties that policy and economic uncertainty brings affects all businessmen whether from Toledo, Tokyo or Turin. This was very much apparent in the conclusions that emerged this year from Business International's Chief Executive Officers' Roundtable. This forum each year draws together top executives from among some 150 companies around the world to discuss changes in the world environment that affect global business. The concerns voiced by the group, I believe, can help shed light on what we are discussing today.

Let me share with you some of concensus that emerged from their deliberations, and I quote:

> "The key challenge facing the world today is how to integrate a global economy in which all the elements are vastly interdependent, and in which every policy, every remedial measure can lead to consequences beyond the realm of understanding of those making the decisions both in government and the private sector.
>
> "Recognition of the need for worldw de policies and programs by national governments is unlikely to be significant or consistent enough to avoid more years of surprises and unpleasant difficulties. Trouble is brewing. In the view of many top executives the current US budget deficit and high interest rates add up to the most serious world problem since World War II.
>
> "The world's major challenges can only respond to transnational solutions. Unfortunately, many obstacles lie

> in the way including nationalism, the principle of sovereign equality (which gives each nation in many international institutions one vote regardless of its stake in an issue), and ideological differences. Thus far, nations are attacking the problems on a crisis-to-crisis basis without any effort to deal with root causes and the broad spectrum of related issues.
>
> "It is essential that the US recognize its international responsibility and pursue a clear policy course persistently. US business should call on the Reagan Administration to place higher priority on reaching consensus among developed countries in order to help international institutions cope with problems particularly in areas that affect companies such as trade and transfer of technology."

These observations by top businessmen from around the world have ramifications for our discussions. The implications are very simple: We must be extremely careful in what each of our nations strives to do alone. We must make every effort to coordinate our policies lest we drag each other down. We live in one economy, what one speaker at our conference called "worldeconomy"; one word, worldeconomy.

New industries, new barriers

In one respect, the current situation does have a point in common with the heady period for US business at the end of World War II. Like before, we stand on the threshold of major advances in technology and its application to our everyday lives. Like before, the US is very much at the vanguard of these new developments that are flowing from our universities, major corporations and smaller-sized, innovative companies. But, unlike before, other nations are not as receptive as they once were to our technology. The reason is very straightforward: these nations want to build

their own industries and do not want to be beholding to or vulnerable to US technology.

No where is this more apparent than in information technology including computers and telecommunications. Information technology is only one of several exciting areas of scientific advancement. Another is biotechnology that is leading to breakthroughs in drugs, agrochemicals, genetics and even energy. A third key one is the science of new materials that continues to pump out new substances to be used in the electronics field to help reduce costs and increase capacity and is creating new materials for use in buildings, vehicles and aircraft to name just a few applications. In all of these fields, the US is in the lead not only in the laboratory but also in application of this research to substitute for older methods and materials and to open the way to new areas of opportunity never even dreamed of before but being made possible now through new technologies.

Like in the postwar period, these developments could be the stimulus needed to lead to revitalized growth and to new industries that can replace mature operations, taking up some of the slack in the unemployment rolls. But, as I said, barriers are already being erected against the most advanced of the three areas mentioned above--information technology. The flow of computerized information across national boundaries, also know as TBDF (Transborder data flow) increasingly is becoming of concern to US multinational companies because it is so vital for their farflung operations. It is used to link parent with subsidiary, to keep financial tabs on operations, to ship orders, maintain inventory, to design products

via computer to the customer's specifications and the like. TBDF is also a source of growing business in itself in the form of computers, peripherals, and software. Our industry is far-advanced of others in hardware and software, making the field a natural one of expansion for our overseas business.

Unfortunately the path to the application of TBDF is getting rougher internationally. One concern of other nations is the privacy of individuals and the fear that it might not be as protected as it is under domestic laws if it is easily accessible via computer linkups to other countries. This worry has already lead to restrictive laws in many countries in Europe and to a Council of Europe Convention on data protection, which as it goes into effect sometime this year would effectively freeze out data flow to the US, which is not a signatory and outside a common data protection zone that is being created. We in the US are as protective of the privacy of the individual as are the nations in question but we do not have an omnibus law on privacy but instead rely on numerous, less obvious pieces of laws to protect individual privacy.

The privacy issue is but one of many affecting US information technology and its free flow abroad. Other countries are concerned for the development of their own information-related industries for both economic and security reasons. Too, many are trying to protect telecommunications, which is usually a government monopoly most everywhere in the world except here. To protect their nascent industry, both hardware and software, and their PTTs, or telecommunications authorities, they are restricting our technology

through manipulation of standards and restrictions on private telecommunications use. These are adding to the costs and proving to be at a minimum, a bureaucratic headache and at worse, an effective barrier to trade.

New wrinkles are developing all the time. Let me give you an example. Recently, the systems analyst of a US company who had been installing systems in several of her company's plants in Great Britain ran into difficulties with UK Customs officials. She had been bringing in systems disks containing the appropriate software and declaring only the value of the encoded disk, about $250. But suddenly, customs officials decided to stop her, asking for the actual value of the software in order to levy a 15% value-added tax. They meant the entire software value including total development and programming costs, something she could not possibly know or have the thousands of dollars it would cost to cover the tax. They confiscated the disk for some days and finally resolved the issue by placing the tax on the intracorporate charge being charged to the UK plant by the US parent. As you can see transborder data flow can be full of surprises and constant barriers.

Such information flows and the means they use are but part of a growing picture of trade protectionism. As the heads of the world's leading nations gather in the summit meeting this week, protectionism remains a top item on the agenda as it has in many of the previous such affairs. The issue will not easily go away as long as our trading partners have to worry about slow growth and unemployment prospects at home and feel protectionist pressures in the vital trade they do with the US. There are no good guys vs. bad

guys on trade barriers issues: we all are guilty and engaging in stalling imports.

There are several implications for our discussions here today. First, the US is in a command position in many technological areas; let's not forget that; we do tend to put ourselves down too much on this score. Second, we are in dire danger of being closed off from freely utilizing these technologies in other markets of the world as can be seen in the experience on transborder data flows. Third, as we formulate policy we should keep in mind the tremendous potential of our technological lead and make certain that we hang tough in international forums to press for freer flows of our technology where it does not compromise our own national security.

The private sector is adjusting

Far too often legislators and government officials around the world, in their haste to guard their nations' interests, look for ways to help protect their industries without realizing how much business can and does do for itself to meet changing conditions in comparative advantage and competition. Sure, companies often do ask for import protection and for rules that give them an edge in the home market. But most executives recognize that the only way to stay permanently in the game is to adjust themselves to new circumstances.

Let's look at the case of the German machinery sector. Over the last three years it has seen both its domestic and foreign sales drop. Last year, for example, it experienced a serious falloff in shipments to the US, its Number 2 market, despite favorable exchange

rates. Economic recovery is currently helping the industry but many German managers are quick to concede their share of strategic mistakes and are not just depending on the current economic upturn. The industry is making several hard choices on its own to restore the competitive advantage German machinery once had on reputation alone, which has been lost to technological and cost edge of its competitors:

Capacity-cutting and rationalization. Over the last five years, the sector has let go of 90,000 workers and is rapidly moving toward a smaller workforce by the 1990s. One large German firm, for example, has set a goal of reducing labor costs from over 35% of total costs today to below 30% by 1990.

Reevaluating priorities. Companies are taking a hard look at the profit outlook of their product lines with a mind to stay only in those that are likely to prove profitable and to get out of those that are not before competition forces them out the hard way. One company, heavily dependent on its steel pipe operations, is planning to hold on to its market share in the US and the Soviet Union by drastically reducing costs, mainly by modernizing the operation (with the help of regional government assistance for a new plant) and cutting labor.

Use of new technology. Some two-third of the industry's equipment is over 10 years old, something that companies want to take care of and quick. German machine makers are very active in applying electronics to their processes and the potential for further application is high. Some firms are reaching a high degree of automation with flexible machinery systems, unmanned part and

material handling, and CAD/CAM.

Movement into new product markets. Here companies are finding new niches for themselves. One firm, for example, is moving away from the vulnerable heavy construction equipment field into aerospace technology. In joint venture with the French, it is producing parts for booster rockets used for satellite launches. It sees consumer applications for some of the technology it is using particularly in new fiber materials used for struts and shafts.

Such adjustments are being seen elsewhere in Europe. In Sweden, a major industrial group, is in the drawn-out process of getting its executives acquainted with computers. It worked on reducing resistance by allowing trials at home and using extensive in-house training. Others are working to pave the way for extensive use of computers by carefully including labor unions in the act to explain what the systems will eventually mean for efficiency and flexibility in meeting competitive pressures.

There are plenty of cases closer to home of adjustment by companies and of growing entrepreneurship. The points I want to make are: 1) everyone is groping to get back into the competitive game, often on fair terms of successful business practices; 2) excessive tampering with the process could distort markets; and 3) there is an enormous market for US knowhow and technology if only it can operate unfettered.

Technology: the downside for developing countries

Many signs are pointing to a change in international trade that may derail the modernization process in developing countries and change our perceptions of where future wealth will be created. At

one point, there was a steady stream of activities, highly labor-intensive in content, that was being phased out of the industrialized world toward sites in the developing world. In these industries, labor-rich developing countries had a natural comparative advantage. Such migrant operations went beyond simple consumer goods to include basic machinery, tools, electronics and other industries. Improved productivity and sophisticated technology may be ringing the deathbell for comparative advantage in this classical sense.

Technology now makes it possible to reduce the labor content of these formerly labor-intensive operations and shift these activities back to the industrialized world. For example, when integrated circuit assembly was done manually, it took more than three times the labor cost to peform the operation in the US than in some low labor cost site such as Hong Kong. That cost has been reduced in just a dozen years so that now with automation the labor-cost differential is marginal. As it gets cheaper to do it in the US, for example, many companies, rather than get involved with locating in politically risky sites and being entangled in currency and trade restrictions will be choosing to keep operations closer to home.

Technology costs run very high, and companies will probably choose not to risk having automated plants abroad because of these costs. A number of firms have already opted to greatly automate plants in the US for worldwide operations, especially in heavy equipment which requires constant change of specifications for individual customer needs. The trend had been to put such operations in overseas sites because of labor and materials costs,

but robotics is changing all this.

The same is true for services. At one point, labor intensive services were thought to be shifting to the LDCs. However, as the cost of services are driven down, companies are finding less reason for transferring these to low-labor cost centers abroad.

Other areas vital to the development of LDCs are also suffering from technological advances. Developing countries have been seeking more R&D to be performed locally. But companies are finding that cost efficiencies dictate that much of their research and development be done centrally. Even local adaptation of products and design changes are being centralized since computer to computer links allows changes in specifications to be done back home.

I have brought up the above points because of the effect it will have on developing countries and global trading patterns. The transfer of many operations to sites in the developed world will affect the ability of developing countries to generate the wealth they need to assure social stability among their growing populations. It is also the same wealth that has made good business prospects for exports of finished goods and components from the US, Europe and Japan. The hopes of many of the more advanced of these developing countries has been to export into the developed world many of the products that will not be competitive with plants in industrialized countries. Such changes in trade patterns will have reprecussions on the ability of the LDCs to retire foreign debt with export income. It means that only those with a significant industrial base or some extractive industry prospects can hope to do as earlier planned.

Changing forms of doing business

When US companies began to develop their overseas business in earnest 30 years ago, they started with export operations run through distributors and agents. Then they moved on to branch operations, followed by wholly-owned subsidiaries, many of which later took on local equity and joint venture partners. Forms of doing business abroad are evolving rapidly; the more they change the more they remain the same but with new twists. Let me explain.

Take exports. It no longer is a matter of exporting goods and getting paid for them. An increasing number of countries, some 80 at last count, now require some form of countertrade in partial or full payment for goods received. Estimates on how much of world trade has been "demonetarized", in a sense, varies from a low of around 8% to as high as 30%. The practice has reach far beyond Eastern Bloc countries where such ideas as counterpurchase (buying items from the country as a form of payment) and buyback (buying the output from plant and equipment sold to them) have reached high degrees of intricacy and sophistication.

Countertrade has many implications for world trade. For one, companies must be in a position to accept, and even guide, the terms of such trade or their competitors will capture these markets. For another, the practice raises all forms of issues for governments, such as ours, regarding financing of such trade, acceptance of such compensatory trade at one's borders, etc. A third point, countertrade plays havoc with third country markets, where products accepted in countertrade deals often wind up at a

discounted price in competition with similar products coming in through ordinary channels.

On another scale, US- and other-based companies are learning to live with less equity control and investment in their overseas ventures. Non-equity relationships of companies that are closely related through former ownership and control presents all forms of difficulties not only for "parent" executives but also for governments, like our own, that often try to apply laws with an extraterritorial reach. Companies are also starting to form cooperative ventures that differ from the traditional joint venture. These new forms of joint enterprise grow out of coinciding interests, and are not joint ventures in the traditional sense of having shares and a mandate of their own. For example, in Germany one tool maker company has been sharing service and maintenance with two electronic firms. As a top executive at the tool firm put it "Their control-system supplier service technicians know our machines well enought to be of use when necessary, just as our technicians are familiar with their control system maintenance."

Another important way in which overseas business is changing is in the size of operations and of the new players. Many new technological developments are coming out of small and medium-sized companies in the US and elsewhere, and many of these are following the business stream pioneered earlier by their bigger counterparts when they first started in international business. These smaller operations appear less threatening to overseas host countries and they are good conduits of needed high technology. As a side note, many big companies are moving toward working with these smaller

firms, subcontracting out parts of their business while they concentrate on what they do best, coordination and development of markets and sources of supply.

This phenomenon of the smaller, highly innovative company venturing abroad has implications for US policy. Such firms may be the thrust we require in exports, provided that they are helped along in various stages from R&D to trade financing and facilitation. The trend toward cooperative ventures also require study and policy decisions.

State-owned enterprises

State-owned enterprises (SOEs), which engage in direct industrial and manufacturing activity, are a difficult phenomenon for private-sector firms to contend with when operating abroad. Until very recently, the trend was to create more SOEs. Tight government budgets and looming deficits are convincing countries that have them to cut back on SOEs in their stables. France, Brazil, and Mexico are all in the process of selling off some of these industrial holdings, placing them back in the private sector. But few such countries are actually abandoning the SOE concept; instead they are dieting, fine-tuning their appetites to hang on to the most nourishing of such holdings.

Why are these enterprises a wild card in international trade? Several reasons: The absense of pressure to earn a profit means that they can expand into overseas markets even with poor profit prospects; their chief concern is to preserve jobs at home, i.e. maintain employment even at below-cost levels of operating. They

have preferential access to government financing which allows them to charge lower prices than competitors at home and in third countries. They have built in markets in that government agencies are per force required to purchase from them.

In several ways, the SOE is an effective instrument of economic nationalism. It can be made to keep investment at home, forced to buy from local suppliers, hire a workforce in excess of true needs. The SOE carries out national industrial policies, unquestioningly. In some ways, SOEs are a way around the reductions made in tariffs and non-tariff barriers under the Kennedy and Tokyo Rounds of multilateral trade negotiations. Their existence allows governments to restrict imports via practice, not open fiat, and to subsidize export operations, without appearing to be doing so through such banned instruments as tax rebates and the like.

To some degree, any policy deliberations by the US regarding facilitation of R&D, help to smaller businesses venturing overseas, and evaluation of our industry's relative competitiveness should not overlook the SOE phenomenon.

In summary and conclusion permit me to identify, based on BI's close working and reporting relationship with 300 major MNC's operating all over the world:

The Causes of Corporate Change

The basic problem which is affecting mature companies is the

violence of the changes in the environment which negate normal rational planning. Some way has to be found of adapting to this because it is unlikely the situation will change. Indeed many companies have found that their entire business environment has changed around them.

Changes in the External Environment

- lack of stability in most economies which has destroyed the capacity to optimise. In the same way as automation lends itself more readily to mature, i.e., stable industries, optimization of operating performance requires operating stability;
- the extreme variations in currency which have been unpredictable and inhibit proper manufacturing and sourcing planning;
- the changes in technology which have rapidly made obsolete both human and company skills and created new ones;
- the volatility of basic commodities and the knock-on effect of the changes, i.e., oil, tin, copper and food. This has resulted in huge changes in the national ability to purchase, which has totally disrupted export markets and planning;
- the disappearance of steady economic growth which means a zero sum game in which growth can only be achieved by increase in market share;
- the emergence of government action and dirigisme in many countries as governments attempt to meet the expectations of their citizens, reduce unemployment, and raise living standards;
- the rise of protectionism, both open and covert, as governments attempt to protect their employment situation;

- the vast increase in external debt and its continued uncontrolled growth as governments and the central banking system attempt to accommodate the requirements of the Third World. The implications on this for future lending and confidence;
- the ending of the coincidence that the number of jobs available will roughly equal the number of people wishing to fill them.

The Coming Global Business Environment

1. The decentralization of large companies into small groups and the proliferation of small businesses.

This will be the huge economic change in the next decade. New businesses will develop as a consequence of the changing requirements for survival and prosperity in the business environment. The low cost of entry, the declining advantages of economies of scale -- in manufacturing as small scale operations become more adaptable and flexible due to advances in computer aided manufacturing technology, the need for rapid interaction, the requirement for coordinators, managers and specialists of all kinds will cause them to flourish. In many cases they will be complementary to large companies and skill in using them will be a major factor in determining the success of the larger organization.

2. The end of the age of collectivism.

The change in type of company, and the rise in the small scale

entrepreneur, together with the enormous diversity of the knowledge of work performed, will mean that there will no longer be large masses of people all doing the same manual jobs who can be organized into trade unions. However, the economies of Eastern Europe are based on the principles of large-scale collectivism and big-scale operations and will not be able to change and adapt because of the political imperative of stability. This means that the gap between East and West, in terms of living standards, will widen.

3. There will be continued, structural unemployment in the OECD countries.

Seepage of all kinds of work to the less developed countries as their infrastructures become sufficiently viable to support low cost manufacturing, will take place. However, there will be a return of many of these jobs by high-tech, sophisticated occupations in the developed countries, and these will, in turn, create more dependent jobs as the new spear-head industries employ people, who then develop wants. However, the rate of new jobs created will still be considerably below that required to diminish unemployment. This should be corrected in the industrial world after 10 or 15 years by demographic changes.

4. There will be a major shift in demographics.

There is already an aging population under existing trends. Recent advances in medical science are going to have an enormous impact in lowering the death rate. This will again cause a growth in the number of over-70's. In the most productive age range, 20 to 40

years, growth will be stagnant in the industrial world, explosive in the developing countries.

5. Constant struggles with public spending.

The tension caused by the widening of the gap between Eastern and Western Europe, the constant African problem which will become the new Balkans, the revolutionary tendencies in Latin America, will continue to create a demand for arms. Arms will continue to become more sophisticated and therefore, more expensive. Unemployment and an aging population will also make large demands on government revenue. In addition, a tax system geared to large companies and large numbers of employees, working under well organized pay-as-you earn tax systems, will not easily be adapted to the new kind of economy. Black economies are expected to thrive, as is happening in Italy. The preoccupation of government will be concentrated on achieving accommodation of public spending demands.

6. High real interest rates are here to stay.

The perennial public spending problem will constitute the majority problem of the next decade. It will be tackled either by the soft option (inflation) or high interest rates. High interest rates are likely to be the case, worldwide.

7. The growth of aid dependency.

There has been a steady growth in aid dependency which is now about $35-40 billion in Africa alone, distributed by a large number of agencies. The nation state has not taken hold in Africa, the small

wars will continue and for political reasons, it will be impossible to impose adequate financial discipline. Therefore, these disciplines will be (as they are now) imposed by outside aid agencies, and this trend will continue.

8. The debt problem will become institutionalized.

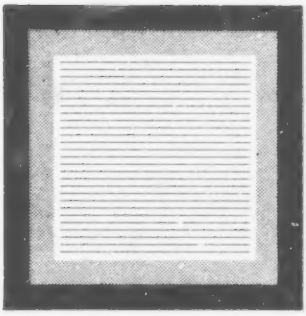
The current figure of $650-700 billion is going to continue to rise in the long term. The inability to service the interest payments is now becoming apparent and will become more so after the economic turndown of '86/87. It is going to cause banks to request "institutionalization" of some of the major indebtedness. Some new kind of IMF-like institution is likely to develop for lending to Third World countries. This will avoid the banks having their balance sheets damaged by the existence of non-performing assets on their books and consequent shuddering throughout the banking world.

9. Investment will continue to be oriented towards the short term.

Interest rates remaining high will keep capital away from long-term projects. This will affect Japanese companies who may have to change their debt/equity ratios and become more short-term oriented. Money will remain scarce.

10. Heightened competition.

The low cost of entry and the ability to produce small batches at low cost have meant that sheer power or size has less competitive punch. Many companies have already found that the old criteria for competing successfully are now invalid. It has become increasingly difficult to differentiate products. Local production is no longer as important -- except to governments. The company with the ability to nurture and develop flexibility, and therefore a successful competitive strategy, will be the one in the strongest position.



The Effects of US Corporate Foreign Investment 1980–82

A SPECIAL RESEARCH STUDY UNDERTAKEN BY
Business International Corporation
One Dag Hammarskjold Plaza, New York, N.Y. 10017

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Preface

This report is the twelfth in a series of analyses of the performance in the US of a wide range of US corporations having a high percentage of their assets located outside the US. The first report was completed in 1972 and covered the years 1960 through 1970. The second, dealing with the 1960–72 period, was completed in 1973 at the request of the House Ways and Means Committee, because there was some question as to the performance of US-based international companies in 1971 and 1972, when the US trade balance and balance of payments experienced serious deficits. The third study covered 1970 through 1973. The fourth report was an analysis of the companies on the **Fortune 100** list for the 1960–75 period. The fifth covered 1974 and 1975, the sixth 1976, the seventh 1977, the eighth 1978, the ninth 1979, the tenth 1980, and the eleventh 1981.

This report covers 1982 and the 1980–82 period. It is, in effect, an update of the previous research done for the years 1960–81.

The reports have been motivated by a desire to test the accuracy of the job-export theory, which is propounded by government officials, members of the US Congress and Senate, some of the leading US newspapers, a number of academicians and, most frequently, US labor union leaders. In brief, the theory avers that foreign investment by US corporations causes the export of American jobs, that this exporting of jobs stems from the transfer of productive capacity from the US by US domiciled companies to countries with low labor costs, and that it results in the subsequent importation into the US of the products manufactured in those foreign facilities. If the theory is correct, then it could be argued that corporate foreign investment might be against the interests of the US and the majority of its citizens.

What has been done here is to secure various data from US companies, on a confidential basis, on their sales, exports, imports, investment, international capital flows and employment. The data were then aggregated and compared with the performance of US manufacturing companies as a whole. The research over the years has indicated that most, if not all, of the claims associated with the job-export theory are inaccurate. This report brings the research up to date and again indicates that the job-export theory lacks substance.

This report breaks down the data for manufacturing and petroleum companies. It does not repeat the theoretical framework—possibly explaining why corporate foreign investment is so

favorable to the US and its citizens—which appears in the first chapter of the first report. Nor does it repeat the findings, based on a wide range of in-depth personal interviews, that are also found in the base study.

The report does follow the same pattern as the earlier ones. It gives a very brief executive summary of the key findings of the analysis. Chapter I provides a longer and more detailed outline of the research results. Chapters II through V examine each of the major areas of data in some depth. Chapter VI measures the export and US-employment performance of US companies relative to the intensity of their foreign investment. Statistical tables provide data for those interested in further analysis.

Further updates of this series will certainly be needed. While many of the variations in the findings of this report as compared with the earlier studies result from differences in the sample of companies that supplied data, they also measure to some extent changing investment and operating practices and environmental conditions. It is conceivable that effects that are favorable at one time may become unfavorable later on. Certainly, the persistent popularity of the job-export theory, despite the clear evidence of its lack of factual foundation, indicates that research should be continued and updated.

Business International has applied a similar research technique to the effects of incoming corporate investment on selected host countries, Australia, France and Mexico. That study was released in 1979, and confirms that international corporate investment is favorable both to the capital-exporting and capital-importing country from an economic point of view.

This report was prepared under the leadership of William Persen, Senior Vice-President of Business International Corp.

Executive Summary

Purpose

This study was undertaken by the research staff of Business International to determine the effects of US business investment abroad on the US economy in 1982.

Scope

The study, which covers 56 US corporations—54 manufacturers and two petroleum companies—analyzed the following:

1. Sales, Exports, Imports;
2. Investment—Domestic and Foreign;
3. Contribution to the US Balance of Payments;
4. Employment Growth;
5. Foreign Investment Intensity.

Profile of Sample

The 56 companies sampled include not only many of the more intensive foreign investors, but also some firms with little or no overseas investment. In 1982, this sample group, representing 11.7% of US industry's total ex-factory sales, accounted for the following:

1. Worldwide sales of $305 billion, of which $105 billion, or about 34%, were to non-US customers;
2. Exports of $24 billion, representing 23% of the exports of all US manufacturers, with about 44% going to their foreign affiliates;
3. Imports of $10 billion, under 3% of all US imports;
4. A trade surplus of over $13.5 billion;
5. More than 22% of the book value of all US foreign manufacturing and petroleum investment.

Findings in Brief

1. Employment

Highly foreign-investment-oriented US companies decreased US employment less greatly than other US manufacturing firms. Overall US employment in manufacturing fell 13.2% during the 1980–82 period. For the companies in the sample, total US employment fell 9.6%. In 1982 the percentages were 7.8% and 6.4%. In 1982 the more intense foreign-investing companies decreased US employment by 5%, the less intensive foreign investors by 8%.

2. Exports

Products made in the US for resale without further processing made up more than two thirds of total exports to foreign affiliates of companies in the sample. Firms in the sample with higher percentages of foreign investment increased their US exports faster than did those with lower levels of foreign investment.

3. Imports

US firms investing abroad do not do so merely to replace US production. Imports from foreign affiliates make up less than 2% of US domestic sales of the sample.

4. Balance of Trade

The balance-of-trade surplus of the companies in the sample continues, while the overall US balance of trade worsens. The balance of trade with foreign affiliates continues to be in substantial surplus.

5. Balance of Payments

Total remittances from foreign affiliates to the US (of dividends, branch earnings, interest, royalties and fees) for the sample rose from $1.8 billion in 1980 to $2.6 billion in 1982.

6. Investment—Domestic and Foreign

Although the rate of foreign investment has been slowing somewhat, over 25% of the sample's gross worldwide investment in 1982 was outside the US.

The sample's expenditures on net new fixed assets in the US have been increasing faster than expenditures of all US manufacturers. The sample's 1982 expenditures on net new fixed assets in the US were 4.2% greater than the year before and 15% greater than in 1980. The comparative figures for all US manufacturers are 3.1% and 14.8%.

Chapter 1
Overall Findings

This study of the year 1982 and the 1980-82 period confirms that in almost every conceivable test of what might be considered good or bad for the US, outgoing corporate foreign investment must be viewed as good. It would appear that without the relatively large amounts of foreign investment by US-based corporations in the past three decades, the international economic and political position of the US would be much less consequential than it is today; the dollar would be weaker; and the US standard of living would be lower.

These far-ranging conclusions are admittedly debatable. What the study does indicate beyond doubt is that the job-export theory—the theory claiming that outgoing US foreign corporate investment exports jobs—is without foundation.

Here are the main findings, divided into sections on the nature of the study sample; the overall sales, exports and imports of the sample; its investment patterns; its balance-of-payments performance; its employment performance; and the interrelationship of the intensity of foreign investment and US exports and employment.

The Nature of the Sample

The sample consisted of 56 corporations, two of which were petroleum companies and the rest manufacturing firms. The sample's sales to US customers and its exports from the US in 1982 reached $224 billion, which represented 11.7% of US factory shipments.

The sample, while including a number of firms with little or no foreign investment, is strongly oriented toward foreign investment. Of the total book value of US foreign corporate manufacturing investment in 1982, manufacturing companies in the sample represented over 27%. The 1982 exports of the sample were over 20% of total US manufacturers' exports.

In sum, the sample is heavily skewed toward foreign investment. If foreign investment is bad for the US—if it exports jobs, increases imports or lowers the US standard of living—then the performance of the sample should indicate those dire consequences. The sample's US employment should fall, while that of other US corporations should go up (or fall less slowly), and the sample's imports should be increasing rapidly, while those of other US firms should be rising less quickly. None of those results occurred. Indeed, the opposite was found to be the case.

Sales

The sample's worldwide consolidated sales fell in 1982, the first time that has happened since Business International has been doing these studies. All of the decrease was in income from outside the US. For manufacturing companies, non-US income dropped 4.7% and for petroleum companies, 24.8%. For both groups US income rose marginally in 1982.

The Sample's US Exports to Foreign Affiliates Performed Better than to Other Purchasers

1.9%
Fall in 1982 exports to affiliates

3.8%
Fall in 1982 exports to others

The Sample's Total US Exports Performed Better Than All US Nonagricultural Exports

3%
Sample's fall in 1982

8.1%
Fall in all US exports in 1982

Exports, Imports and the Balance of Trade

Exports by the sample to foreign affiliates reached $10.4 billion in 1982, falling slightly from 1981 and rising slightly over 1980. Exports of finished goods not requiring further processing before resale by foreign affiliates made up over 68% of all exports to affiliates.

As noted in the first study of this series, one of the key factors explaining why setting up productive operations outside the US enhances (and upgrades) employment in the US is that such ventures lead to the establishment of intensive marketing networks to sell products that are manufactured abroad. These networks become a much more efficient mechanism for the sale of goods produced by the company in the US but not manufactured abroad. Without doubt, a substantial amount of US products would not be exported were it not for the existence of the US-owned foreign marketing networks, which in turn were made economical only as a result of a non-US production operation.

Exports to other purchasers came to $13.1 billion in 1982, down 3.8%, a drop much greater than that to foreign affiliates. Total exports fell 3%, to $23.5 billion, a fall well below the 8.1% decline of total US exports of nonagricultural products in 1982.

Imports from foreign affiliates amounted to $5.3 billion for the sample as a whole in 1982. Imports from affiliates fell slightly, after deleting one unusual company and oil company from the figures.

But the real issue is the relationship of total imports from foreign affiliates to total sales to US customers. According to the job-export theory, US firms invest abroad to transfer productive facilities from places where wages are high (i.e. the US) to places where they are low (i.e. outside the US). Then the firm continues to sell in the US, substituting products manufactured abroad using "cheap labor" for those formerly made in the US. In other words, the goods produced by the foreign affiliates are imported into the US, supposedly replacing items that would otherwise have been manufactured in the US. If there is any factual basis for the job-export theory, the US imports from foreign affiliates of a group of companies highly oriented toward foreign investment should be very sub-

Profile of the Sample

The sample comprises a total of 56 companies, of which 54 are manufacturing firms and two are petroleum companies. Computer aggregations of these two groups were carried out separately because of the very different nature of the petroleum industry. A list of the companies has been included in Appendix A.

The firms in the sample achieved total sales to US customers, plus total exports, of $223.5 billion in 1982, which represented 11.7% of the shipments of all US manufacturers. In other words, the sample represents more than one ninth of all US manufacturing industry.

However, the sample is composed largely of corporations with relatively substantial non-US operations. The total book value of the sample's foreign affiliates at end-1982 was $32.6 billion, representing 22.3% of the total value of all US-owned manufacturing and petroleum foreign affiliates. And the manufacturing firms in the sample had a non-US net worth of $25.3 billion, representing 27.8% of the total value of all US-owned manufacturing foreign affiliates.

As might be expected, the sample's manufacturers have a larger percentage of US exports than of US factory shipments. Exports totaled $23.5 billion in 1982, equal to 13.8% of total US nonagricultural exports and about 23% of all US manufacturers' export sales for 1982.

While the sample differs in size and composition from those that were developed in the earlier Business International studies of the effects of foreign corporate investment on the US, it does provide a group of firms with a strong international bias. Therefore, this group can be used to measure the behavior, as well as the effects on the US, of foreign direct investment.

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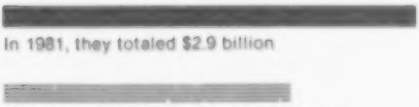
Finished Goods Make up a Significant Share of Exports to Foreign Affiliates



stantial, i.e. they should make up a high percentage of total sales to US customers, and that percentage should be growing rapidly.

This is not the case. Imports from foreign affiliates account for only a tiny portion of US sales—a mere 1.6% of US sales in each of the years 1980, 1981, and 1982.

Imports from unrelated suppliers reached $4.7 billion in 1982, a slight increase (0.9%) over the previous year, if measured on a consistent basis.

The effect of foreign corporate investment on the trade sector is best measured not by exports or imports separately, but by the combination of the two—by the impact of such investment on the overall balance of trade. If increases in exports resulting from such investment occur only at the cost of even larger rises in imports, the cost of the export increases

The Sample's Overall Trade Surplus and The US Trade Deficits

The Sample's Imports from Affiliates as a Percentage of US Sales were Negligible

might be considered excessive.

The sample scored balance-of-trade surpluses in every year: about $18 billion in 1980 and 1981 and over $13.5 billion in 1982. (With their foreign affiliates alone, the sample had trade surpluses of $8.4 billion, $8.5 billion and $5.2 billion, respectively.)

The sample's trade surpluses in 1980, 1981, and 1982 compare with overall US trade deficits of $20.1 billion in 1980, $27.6 billion in 1981, and $31.8 billion in 1982.

Investment

As might be expected from discussion of the nature of the sample earlier in this chapter, a rather substantial proportion of the net assets of these companies is invested outside the US. Gross investment, defined as total assets less current liabilities, outside the US as a percentage of worldwide gross investment was 25.3% in 1982, falling from 28.8% in 1980. Net fixed-asset investment outside the US by the sample as a whole was 22.5% of that worldwide in 1982, falling from 29.7% in 1980.

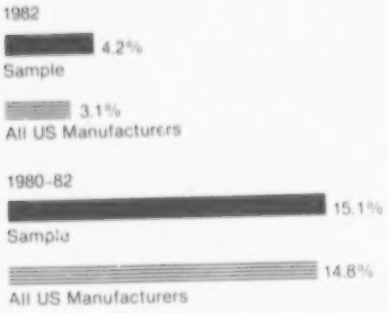
But more important for this study is the gathering of data on investment in order to test another common charge by those who criticize foreign investment by US corporations—that investment abroad means less invested in the US. Here are the facts:

- The sample's expenditures on net new fixed assets in the US in 1982 were 4.2% higher than they were in 1981; the expenditures of all US manufacturers on new plant and equipment in the US in 1982 rose 3.1%.
- The sample's expenditures on net new fixed assets in the US in 1982 were 15.1% higher than they were in 1980; the expenditures of all US manufacturers on new plant and equipment in the US in 1982 were 14.8% higher than they were in 1980.

The Balance of Payments

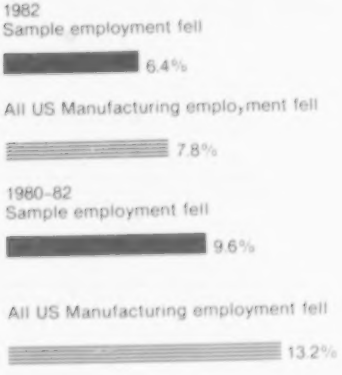
Another favorable impact of foreign corporate investment on the US stems from the effects of such in-

The Sample's Investment in the US Rose Faster Than All US Investment



vestment on the balance of payments. While the original investment in a foreign operation is an outflow item, such outflows are overwhelmingly compensated for by the inflows of earnings, interest, royalties and fees received by US parent companies from their foreign affiliates (see p. 8). These financial flows supplement the trade surplus that US firms have with their foreign affiliates.

The Sample Had a Better US Employment Performance Than All US Manufacturers



The More Intensive Foreign Investing Companies Had a Better US Employment Performance Than the Less Intensive Foreign Investors

If US companies had not been achieving these balance-of-payments inflows, the US dollar would have depreciated even more during the 1970s than it did. By helping to offset what would have been an even larger depreciation of the dollar, foreign corporate investment helped to prevent an even larger drop in the general standard of living of all people who earn their livelihood in US dollars.

The sample's financial balance of payments was in surplus (the balance-of-payments surpluses scored by these companies exclusive of their very large trade surplus) to the tune of $1.8 billion in 1980, $2.4 billion in 1981, and $2.6 billion in 1982.

Coupling the balance-of-trade surpluses with the financial balance-of-payments surpluses leads to a net surplus contribution by the total sample of about $20 billion in 1980 and 1981, and $16 billion in 1982. It is these numbers that should be compared with the overall US international account deficits.

Employment in the US

This study confirms that the US employment performance of US companies highly oriented toward foreign investment is better than that of all US manufacturers. Taking the sample as a whole, US employment fell 9.6% over the 1980-82 period, compared

with a 13.2% fall in total US employment in manufacturing in that period. In 1982 alone, the sample saw its US employment fall by 6.4%, while all US manufacturers decreased their employment by 7.8%.

Again the inescapable conclusion: The facts simply do not support the job-export theory.

Foreign Investment Intensity and US Employment

As a final test of the job-export theory, the sample was divided into four parts—those companies with the greatest percentage of foreign investment and those with lower percentages—and the US employment records of the groups were compared. This test, like past BI studies, revealed that firms with the largest share of non-US investment to worldwide investment had a much better job performance in the US than did those with less non-US investment. Here are the specific rates of increase in employment in the US for the more intensive and less intensive groups of foreign investors:

- Over the 1980–82 period, the more intensive foreign-investing companies decreased employment in the US by 10.1%; the less intensive companies decreased employment in the US by 10.9%.
- In 1982 alone, the more intensive foreign-investing firms decreased US employment by 5%; the less intensive firms decreased US employment by 8%. Even calculating US employment by the companies in the sample on a net basis, i.e. taking into account jobs gained or lost as a result of takeovers during the period, the more intensive foreign investors did better than the companies with less foreign investment. Indeed, the comparisons are even more favorable for the more intensive foreign investors.

Again the job-export theory is shown to have no basis in fact; the US job performance of the group investing more heavily abroad is better than that of the group placing less capital overseas. If there were any truth to the job-export theory, the more intensive foreign-investing companies would have a much worse job performance in the US than the companies investing less abroad. Since this correlation of better job performance in the US with the more foreign-investment-intensive companies has been consistent throughout all the BI studies so far, it would indicate that the reverse of the job-export theory has more evidence behind it than does the job-export theory. In other words, foreign investment by US companies, at least in relatively large amounts, imports jobs into the US.

US Foreign Corporate Investment Keeps the US Competitive, Strengthens the US Dollar

The crucial impact of US foreign corporate investment on the US international accounts and hence on the value of the US dollar is revealed by the overall data on return flows of dividends, branch earnings, interest, and royalties and fees actually paid each year by US foreign affiliates and branches as compared with the actual annual outflows of new investments in these affiliates and branches. During the 1970s, return flows totaled $147.4 billion and outflows $51.2 billion, for a surplus of $96.2 billion—and in 1980–82 the surplus passed $84 billion.

The actual figures, year-by-year, are shown at right (in $ billions).

These overall figures parallel the performance of the companies in the BI sample. But they do not include the rapidly increasing balance-of-trade surpluses that US manufacturing companies with substantial foreign investment also recorded during the same period.

	Net Return Flow From Foreign Corporate Investment	Outflow of Foreign Corporate Investment	Surplus
1970	7.9	4.4	3.5
1971	9.5	4.8	4.7
1972	10.3	3.3	7.0
1973	12.3	4.9	7.4
1974	20.7	7.5	13.2
1975	13.0	6.3	6.7
1976	14.6	4.6	10.0
1977	16.3	4.9	11.4
1978	18.4	4.6	13.8
1979	24.4	5.9	18.5
1980	25.5	(1.5)	27.0
1981	24.8	(4.3)	29.1
1982	23.1	(8.3)	31.4

Source: US Department of Commerce

Chapter 2
Analysis of the Sample: Sales, Exports, Imports

For the first time in this series of studies, the sample's worldwide consolidated income fell in 1982, down 3.4% to $304.5 billion. All of the decrease occurred outside the US—again a first in this series of studies. And income earned outside the US as a portion of worldwide income fell from 39% in 1980 to 34.3% in 1982. Whether this falloff of non-US income is the beginning of a trend or a temporary blip only the future can tell.

Exports to foreign affiliates also fell in 1982 for the first time since Business International has been keeping records. They dropped 1.9%, to $10.4 billion. All of the drop occurred in finished goods that foreign affiliates sold without further processing. Still, such goods made up 68.4% of total exports to affiliates.

Exports to unrelated foreign purchasers fell even more in 1982 (down 3.8%), to $13.1 billion, indicating that the falloff in exports was a general phenomenon and apparently indicating that the existence of US-owned foreign affiliates mitigated the decline in export sales.

The sample's total exports in 1982 fell 3%, to $23.5 billion, but this drop was well below the 8.1% decline in total US exports of nonagricultural products in 1982.

Table II-9 indicates a huge 1982 increase in imports from foreign affiliates, but this oddity results from the inclusion of one company in the sample that had data only for 1982. If that data is deleted to make the numbers consistent from year to year, imports from affiliates rose only 0.8% in 1982. And if one petroleum company is also taken out of the comparison, imports from affiliates actually declined in 1982 (by 1.1%). Imports of finished goods not requiring further processing fell from 63.6% of total imports from affiliates in 1982 to 63.1% in 1982.

This high percentage of finished goods in total imports from affiliates makes it appear that US companies have been investing abroad in order to establish less expensive sources of supply for sale in the US. But if this were true—and this is the crux of the job-export theory—then imports from foreign affiliates should be rising quite rapidly as a percentage of the sample's sales in the US. Not only should the percentage be rising rapidly, it should also be very large.

If the sample's imports from affiliates are juxtaposed against its sales in the US, the job-export theory can be tested directly. Here is a matched sample of the 51 manufacturing companies that provided complete, relevant data (in $ billions):

	1980	1981	1982
US sales	128.9	140.6	140.9
Imports from affiliates	2.0	2.2	2.2
Imports from affiliates (as a % of US sales)	1.6	1.6	1.6

The job-export theory does not pass the test.

Some US-owned foreign affiliates also export to the US directly to unrelated buyers, but this type of business is quite small (Table II-14). Adding in the exports from foreign affiliates to buyers other than the parent company would not materially alter the percentages just cited.

Imports from unrelated suppliers reached $4.7 billion for the whole sample in 1982. Deleting the imports of the company noted above, which could not supply data before 1982, reveals an increase in im-

ports from unrelated suppliers of 0.9% in 1982. As shares of total 1982 imports from others, finished goods represented 27.9%, capital equipment 1.7%, semimanufactures 6.9%, and raw materials 63.5%.

The gross balance-of-trade surplus of the whole sample was over $18 billion in 1980 and 1981 and over $13.5 billion in 1982. These surpluses compare with US overall trade deficits of $20.1 billion, $27.6 billion, and $23.8 billion in the three years.

Taking the balance of trade with foreign affiliates alone, the surpluses were also in very substantial surplus. If the job-export theory had any factual basis, the balance of trade of US foreign investors would be in deficit.

Table II-1
Consolidated Worldwide Income
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**56**	**295.047**	**315.279**	**304.521**
Manufacturing companies	54	240.768	254.745	250.776
Petroleum companies	2	54.279	60.564	53.745

Table II-2
Consolidated Income in the US
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**56**	**180.039**	**199.468**	**200.007**
Manufacturing companies	54	154.341	167.783	167.965
Petroleum companies	2	25.698	31.685	32.042

Table II-3
Consolidated Income Outside the US
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**56**	**115.008**	**115.811**	**104.514**
Manufacturing companies	54	86.427	86.932	82.811
Petroleum companies	2	28.581	28.879	21.703

Table II-4
Total Exports from the US to Foreign Affiliates
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**54**	**10.435**	**10.651**	**10.444**
Manufacturing companies	52	10.068	10.301	10.121
Petroleum companies	2	0.367	0.350	0.323

Table II-5
US Exports of Raw Materials and Components to Foreign Affiliates
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**44**	**1.283**	**1.222**	**1.321**
Manufacturing companies	43	1.272	1.206	1.312
Petroleum companies	1	0.011	0.016	0.009

Table II-6
US Exports of Finished Goods to Foreign Affiliates
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**45**	**3.291**	**3.192**	**2.862**
Manufacturing companies	44	3.291	3.192	2.862
Petroleum companies	1	0.000	0.000	0.000

Table II-7
Exports from the US to Unrelated Customers
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**55**	**13.216**	**13.607**	**13.085**
Manufacturing companies	53	12.277	12.486	12.098
Petroleum companies	2	0.939	1.121	0.987

Table II-8
Total Exports from the US—Not Exactly Matched
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**54-55**	**23.651**	**24.258**	**23.529**
Manufacturing companies	52-53	22.345	22.787	22.219
Petroleum companies	2	1.306	1.471	1.310

Table II-9
Imports from Foreign Affiliates
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**52-53**	**2.000**	**2.184**	**5.252**
Manufacturing companies	51-52	1.998	2.184	5.212
Petroleum companies	1	0.002	0.000	0.040

Table II-10
Imports of Raw Materials from Foreign Affiliates
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**44**	**0.201**	**0.172**	**0.127**
Manufacturing companies	43	0.200	0.172	0.172
Petroleum companies	1	0.001	0.000	0.000

Table II-11
Imports of Semimanufactures from Foreign Affiliates
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**44**	**0.161**	**0.201**	**0.238**
Manufacturing companies	43	0.161	0.201	0.238
Petroleum companies	1	0.000	0.000	0.000

Table II-12
Imports of Finished Goods from Foreign Affiliates
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**44**	**0.684**	**0.652**	**0.624**
Manufacturing companies	43	0.683	0.652	0.623
Petroleum companies	1	0.001	0.000	0.001

Table II-13
Imports from Capital Equipment from Foreign Affiliates
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**44**	**0.000**	**0.000**	**0.000**
Manufacturing companies	43	0.000	0.000	0.000
Petroleum companies	1	0.000	0.000	0.000

Table II-14
Foreign Affiliate Sales to US Other than to Parent Company
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**43**	**0.791**	**0.526**	**0.586**
Manufacturing companies	42	0.316	0.343	0.368
Petroleum companies	1	0.475	0.183	0.178

Table II-15
Imports from Unrelated Suppliers
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**40-42**	**4.108**	**4.046**	**4.715**
Manufacturing companies	39-41	3.954	3.967	4.636
Petroleum companies	1	0.154	0.079	0.079

Table II-16
Imports of Raw Materials from Unrelated Suppliers
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**35-36**	**2.017**	**2.114**	**1.899**
Manufacturing companies	34-35	2.017	2.114	1.820
Petroleum companies	1	0.000	0.000	0.079

Table II-17
Imports of Semimanufactures from Unrelated Suppliers
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**35-36**	**0.168**	**0.221**	**0.206**
Manufacturing companies	34-35	0.168	0.221	0.206
Petroleum companies	1	0.000	0.000	0.000

Table II-18
Imports of Finished Goods from Unrelated Suppliers
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**35-36**	**0.641**	**0.662**	**0.883**
Manufacturing companies	34-35	0.487	0.583	0.833
Petroleum companies	1	0.154	0.079	0.000

Table II-19
Imports of Capital Equipment from Unrelated Suppliers
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**35-36**	**0.048**	**0.054**	**0.050**
Manufacturing companies	34-35	0.048	0.054	0.050
Petroleum companies	1	0.000	0.000	0.000

Table II-20
Total Imports—Not Exactly Matched
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**40-53**	**6.108**	**6.230**	**9.967**
Manufacturing companies	39-52	5.952	6.151	9.848
Petroleum companies	1-2	0.156	0.079	0.119

Chapter 3
Analysis of the Sample: Investment

Despite the fact that a number of firms in the sample have little or no foreign investment, overall the group is highly foreign-oriented. In 1982, 25.3% of the sample's gross investment was located outside the US (gross investment is defined as total assets less current liabilities). The percentage was 28.8% in 1980 and 28.3% in 1981.

Data were also collected on the annual increase in net fixed assets of the responding companies from year to year. For the sample as a whole, the expansion of net fixed assets abroad as a percentage of worldwide net fixed-asset expansion was 22.5% in 1982, 24.9% in 1981, and 29.7% in 1980.

A more important comparison is that between the expansion over the period in the sample's net fixed assets inside the US and the expansion of plant and equipment expenditures by all companies in the US. The question here is whether the companies that invest large proportions of their investment budgets outside the US do so at the expense of investment inside the US. There are some who claim that a firm that invests abroad automatically invests less within the US than a firm that does not invest overseas.

Previous BI studies have indicated that groups of companies that invest heavily abroad invest in the US over time as much as or more than all US firms, although in any one year that will not be true (probably because of the varying size and makeup of the BI samples). This year's study confirms the findings of most earlier years.

The sample's expenditures by manufacturing companies on net new fixed assets inside the US in 1982 were 4.2% higher than they were the year before. The expenditures of all US manufacturers on new plant equipment in 1982 were 3.1% higher than they were the year before. And over the 1980–82 period, the sample increased US fixed asset investment more than all US companies: 15.1% vs 14.8%.

Table III–1
Year-End Worldwide Gross Investment
1980, 1981, 1982

	Number of respondents	$ billions		
		1980	1981	1982
All companies	**56**	**143.688**	**157.638**	**173.372**
Manufacturing companies	54	124.064	134.547	144.365
Petroleum companies	2	19.624	23.091	29.007

Table III-2
Year-End Gross Investment Outside the US
1980, 1981, 1982

	Number of respondents	$ billions		
		1980	1981	1982
All companies	**55**	**41.390**	**44.585**	**43.884**
Manufacturing companies	54	34.441	36.576	36.123
Petroleum companies	1	6.979	8.009	7.761

Table III-3
Annual Increase in Net Fixed Assets Inside the US
1980, 1981, 1982

	Number of respondents	$ billions		
		1980	1981	1982
All companies	**55**	**12.059**	**14.366**	**13.882**
Manufacturing companies	53	10.416	11.117	11.587
Petroleum companies	2	1.643	3.249	2.295

Table III-4
Annual Increase in Net Fixed Assets Outside the US
1980, 1981, 1982

	Number of respondents	$ billions		
		1980	1981	1982
All companies	**55**	**5.106**	**4.751**	**4.037**
Manufacturing companies	53	4.279	3.751	3.475
Petroleum companies	2	0.827	1.000	0.562

Chapter 4
Analysis of the Sample: Balance of Payments

The foreign investment operations of US corporations have made and continue to make a significant positive contribution to the strength of the US dollar. The overall sample's total financial balance-of-payments surplus rose from $1.8 billion in 1980 to $2.4 billion in 1981 and $2.6 billion in 1982. If US companies had not invested abroad and had not continued to do so, the dollar would have been strengthened to some extent by reduced capital investment outflows and possibly (although it is doubtful) by somewhat larger exports, but it would have been weakened a great deal more by the reduction in dividend and branch-earnings receipts, in royalties and fees received, in sales of US-made machinery and equipment and, probably, in US exports overall.

The sample's capital outflows totaled $213 million in 1982. Remittances received from foreign affiliates—comprising dividends, branch earnings, interest paid, and royalties and fees—were $2.4 billion in 1982. A sizable portion of the capital outflows is offset by the purchase of US-manufactured plant and equipment by foreign affiliates.

All these data are assembled in the table below, which shows the sample's gross financial balance of payments for the years 1980, 1981 and 1982. Because varying numbers of companies answered each of the questions, the totals are only approximations. A matched sample of 18 corporations that responded to all the questions for all years provides parallel information in Table IV-5.

The Sample's Gross Financial Balance of Payments

1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
Dividends, branch earnings, interest, royalties and fees received, plus	44	2.229	2.227	2.412
Affiliate purchases of US-made fixed assets	27	0.112	0.245	0.253
Total receipts	—	**2.341**	**2.472**	**2.665**
Capital outflow, less	35	0.541	0.086	0.213
Parent foreign borrowing	35	0.037	0.024	0.150
Net outflow	—	**0.504**	**0.062**	**0.063**
Net financial balance-of-payments surplus	—	**1.837**	**2.410**	**2.602**

Sourcing Affiliate Capital Equipment in the US

A special set of comparisons was made, aggregating the data provided by respondents to Question 7 of the questionnaire (see Appendix B), on the increase in net fixed assets outside the US, and to Question 9, on the amount of fixed assets acquired by affiliates from the US. A matched sample of 26 companies indicated that a significant share of the machinery and equipment purchased by foreign affiliates comes from the US, although it must also be pointed out that the purchases of such assets are gross (and the additions to fixed assets are net) of depreciation.

The percentages of purchases of US-made fixed assets to net additions in fixed assets were 11% in 1980, 28% in 1981 and 34% in 1982 for the sample as a whole.

Table IV-1
Capital Outflow from the US
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**35**	**0.541**	**0.086**	**0.213**
Manufacturing companies	35	0.541	0.086	0.213
Petroleum companies	0	0.000	0.000	0.000

Table IV-2
US Parent Company Borrowing Outside the US
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**35**	**0.037**	**0.024**	**0.150**
Manufacturing companies	35	0.037	0.024	0.150
Petroleum companies	0	0.000	0.000	0.000

Table IV-3
US-Made Fixed Assets Acquired by Foreign Affiliates
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**27**	**0.112**	**0.245**	**0.253**
Manufacturing companies	27	0.112	0.245	0.253
Petroleum companies	0	0.000	0.000	0.000

Table IV-4
Remittances or Dividends, Branch Earnings, Interest, and Royalties and Fees from Foreign Affiliates
1980, 1981, 1982

	Number of respondents	$ billions 1980	1981	1982
All companies	**44**	**2.229**	**2.227**	**2.412**
Manufacturing companies	44	2.229	2.227	2.412
Petroleum companies	0	0.000	0.000	0.000

Table IV-5
Matched Sample of Financial Balance of Payments of 18 Manufacturing Companies
1980, 1981, 1982

	$ billions 1980	1981	1982
Remittances received, plus	0.709	0.708	0.849
Purchases of US-made fixed assets	0.045	0.052	0.038
Total receipts	**0.754**	**0.760**	**0.887**
Capital outflow, less	0.329	0.019	(0.078)
Parent foreign borrowing	0.031	(0.036)	(0.053)
Net outflow	**0.298**	**(0.017)**	**(0.131)**
Net financial balance-of-payments surplus	**0.456**	**0.743**	**1.018**

Chapter 5
Analysis of the Sample: Employment

If foreign corporate investment does "export jobs," then the highly foreign-investment-oriented set of companies in the BI sample should have ever-falling numbers of employees in the US. And the performance of the group in creating new jobs in the US should be far worse than that of firms that do not invest abroad or that invest much less overseas.

Past BI studies indicate that this is not the case. The sample's US employment fell somewhat slower in 1982 (down 6.4%) than did total manufacturing employment (down 7.8%). Over the 1980–82 period the sample decreased its US employment by 9.6%, against a decrease of 13.2% for all US manufacturers.

These comparisons are based on actual numbers of employees on specific year-end dates. Some of the employees are on sample-company payrolls as a result of an acquisition of another firm. Critics of foreign investment by US companies claim that such employees should not be included in an employment analysis. (In all probability, many of the corporations or parts of those acquired by companies in the sample during this period would have gone bankrupt, and the acquiring firm maintained jobs that would otherwise have disappeared.) Therefore, net employment data were secured by deducting employees of all acquired companies or parts of companies during the period.

On a net employment basis, the sample had a 6.8% reduction in employment in 1982 and a 10.9% reduction over the 1980–82 period, a performance still somewhat better than all US manufacturers.

Non-US Employment

BI studies have revealed that employment by US companies outside the US rose rapidly until the mid-1970s, rose slowly during the second half of the '70s, and began falling in 1980. This study confirms the decrease of employment outside the US.

Table V-1
Year-End Gross Employment in the US
1979, 1980, 1981, 1982

	Number of respondents	Number of employees 1979	1980	1981	1982
All companies	**56**	**2,276,212**	**2,213,517**	**2,198,098**	**2,056,792**
Manufacturing companies	54	2,221,931	2,159,182	2,128,099	1,982,716
Petroleum companies	2	54,281	54,335	69,999	74,076

37-865 0 = 84 - 14

Table V-2
Year-End Net Employment in the US
1979, 1980, 1981, 1982

	Number of respondents	Number of employees			
		1979	1980	1981	1982
All companies	**56**	**2,276,212**	**2,210,525**	**2,174,088**	**2,027,039**
Manufacturing companies	54	2,221,931	1,154,521	2,102,902	1,952,759
Petroleum companies	2	54,281	56,004	71,186	74,280

Table V-3
Year-End Gross Employment Outside the US
1979, 1980, 1981, 1982

	Number of respondents	Number of employees			
		1979	1980	1981	1982
All companies	**56**	**1,113,239**	**1,102,108**	**1,086,246**	**1,052,170**
Manufacturing companies	54	1,093,888	1,081,826	1,065,299	1,030,497
Petroleum companies	2	19,351	20,382	20,947	21,673

Table V-4
US Nationals Employed Abroad at Year-End
1979, 1980, 1981, 1982

	Number of respondents	Number of employees			
		1979	1980	1981	1982
All companies	**49**	**4,812**	**4,908**	**5,276**	**7,056**
Manufacturing companies	47	4,000	4,213	4,232	4,328
Petroleum companies	2	812	695	1,044	2,728

Chapter 6
Analysis of the Sample: Foreign Investment Intensity

What distinguishes Business International's studies on the effects of foreign investment by US companies on the US from those carried out by others has been the examination of the data submitted by the participating corporations not merely in overall sample aggregates, but also in aggregations of the most intensive and the least intensive foreign-investing companies within the sample studied.

Mere comparison of the performance of the sample as a whole against that of all US firms could lead to the rightful criticism that the sample itself was so selective that the comparisons were unrealistic. Stated another way, one could claim that only companies investing extensively overseas that had "good" US employment records responded to the questionnaire, and therefore the sample's aggregated data gave a false picture of the performance of all US corporations investing abroad.

In response to this criticism, an effort has been made in each Business International study to examine whether the firms that have invested the most abroad in relation to their investment in the US have a better or worse US job performance.

In past studies, various different formulations have been used to divide the sample companies into quartiles of foreign investment intensity. One is a simple gross investment ratio. It consists of the total of each company's foreign gross investment in 1980, 1981 and 1982 divided by the total worldwide gross investment for the same three years. Another is a net fixed asset increase ratio, using the same formula and years.

The ratios were determined for each company. The sample companies were then grouped into four quartiles—the first with the highest percentages of foreign investment, the second with the next highest percentages, and so on. The actual percentages of foreign gross investment intensity for the four quartiles were as follows:

Quartile	
I	34.7% and above
II	26.7-33.7%
III	13.3-25.0%
IV	Less than 12.0%

The employment performance of each quartile was aggregated. (Several other variables—including worldwide or US sales, exports, imports, etc.—were also aggregated, but there are generally low levels of correlation in them, except for exports—see box on p. 24.)

If the job-export theory is valid, then the US job performance of the most intensive foreign-investing group should be quite different from that of the least intensive group, i.e. the most intensive group should show a considerably larger decrease in US employment than the less intensive foreign investors.

In past Business International studies in this series—and in the special study of the Fortune 100—that result has not been found. Indeed, the reverse has been the case: The more intensive foreign-investing companies have been the ones that have increased their US employment rolls the most rapidly

(or decreased them less). There has been an amazingly consistent high level of correlation in all the earlier studies and in the Fortune 100 study—not merely when comparing the more intensive and the less intensive groups (i.e. quartiles III and IV), but also when comparing all four groups.

The actual numbers of US employees—gross and net—for each of the quartiles for each of the years are provided in the tables at the end of this chapter (VI-4 through VI-7).

The striking relationship between increased levels of foreign investment and better job performance in the US is shown most clearly by merging quartiles I and II into the more intensive foreign-investing group, and combining quartiles III and IV into a second, less intensive foreign-investing group. Here is the record, using the gross investment ratio, of the percentage changes in US employment on a gross basis of the more intensive and less intensive foreign investors:

	More intensive foreign investors	Less intensive foreign investors
1982	-5.0%	-8.0%
1980-82	-10.1%	-10.9%

And on a net US employment basis:

	More intensive foreign investors	Less intensive foreign investors
1982	-4.5%	-8.9%
1980-82	-9.8%	-13.4%

This study again reveals that the companies with the most significant amount of foreign investment do not export jobs; rather, the reverse is shown.

These comparisons indicate again that the job-export theory simply has no basis in fact, and that the reverse seems to be true—that, on average, the more US firms invest outside the US as a percentage of worldwide investment, the more they increase employment in the US.

Foreign Investment Intensity and US Exports

In most of the studies in this series, there has been little significant correlation between the quartiles of foreign-investment intensity and exports. One apparent reason for this was the inclusion in a number of the studies of significant numbers of low-foreign-investment companies in the aerospace and defense industries, whose exports grew rapidly but in highly irregular patterns. This year's sample includes relatively few firms from these industries, and the quartile aggregations of exports do reveal a correlation between higher levels of foreign investment and more rapid increases in exports.

The percentage changes in total US exports of the companies in each quartile for the 1980-82 period and for 1982 are as follows (companies submitting data for 1982 alone have been deleted):

Quartiles	I	II	III	IV
1980-82	+ 14.5%	-5.0%	-7.4%	+ 14.1%
1982	+ 10.9%	-2.3%	-8.0%	- 4.4%

Aligning the four quartiles into two groupings reveals that the more intensive foreign investors increased exports from the US, while those of the less intensive foreign investors fell:

	More intensive foreign investors	Less intensive foreign investors
1980-82	+ 3.9%	-4.1%
1982	+ 3.9%	-7.4%

Table VI-1
Exports from US to Foreign Affiliates
By Quartiles of Foreign Gross Investment Intensity
1980, 1981, 1982

	$ billions		
	1980	1981	1982
Quartile I	4.118	4.315	4.407
Quartile II	3.082	2.970	2.974
Quartile III	2.628	2.769	2.469
Quartile IV	0.240	0.247	0.271

Table VI-2
Exports from US to Unrelated Customers
By Quartiles of Foreign Gross Investment Intensity
1980, 1981, 1982

	$ billions		
	1980	1981	1982
Quartile I	0.381	0.328	0.743
Quartile II	2.297	2.263	2.137
Quartile III	7.936	7.870	7.317
Quartile IV	1.665	2.025	1.902

Table VI-3
Total Exports from US
By Quartiles of Foreign Gross Investment Intensity
1980, 1981, 1982

	$ billions		
	1980	1981	1982
Quartile I	4.499	4.643	5.150
Quartile II	5.379	5.233	5.111
Quartile III	10.564	10.639	9.786
Quartile IV	1.905	2.272	2.173

Table VI-4
Year-End Gross US Employment
By Quartiles of Foreign Gross Investment Intensity
1979, 1980, 1981, 1982

	Number of employees			
	1979	1980	1981	1982
Quartile I	372,931	351,775	333,432	307,341
Quartile II	513,824	508,252	505,747	489,479
Quartile III	910,588	891,445	886,582	824,411
Quartile IV	420,588	407,710	402,338	361,485

Table VI-5
Year-End Net US Employment
By Quartiles of Foreign Gross Investment Intensity
1979, 1980, 1981, 1982

	Number of employees			
	1979	1980	1981	1982
Quartile I	372,931	348,113	329,156	299,659
Quartile II	513,824	508,608	508,712	500,148
Quartile III	910,588	895,671	874,071	802,749
Quartile IV	420,588	402,129	390,963	350,203

Table VI-6
Year-End Gross US Employment
By Quartiles of Foreign Net Fixed Asset Investment Intensity
1979, 1980, 1981, 1982

	Number of employees			
	1979	1980	1981	1982
Quartile I	512,254	483,154	452,361	425,818
Quartile II	435,505	425,251	424,422	401,707
Quartile III	709,507	701,478	703,945	623,808
Quartile IV	560,665	549,299	547,371	531,383

Table VI-7
Year-End Net US Employment
By Quartiles of Foreign Net Fixed Asset Investment Intensity
1979, 1980, 1981, 1982

	Number of employees			
	1979	1980	1981	1982
Quartile I	512,254	481,104	450,568	432,507
Quartile II	435,505	423,465	423,888	395,984
Quartile III	709,507	703,730	693,735	608,086
Quartile IV	560,665	546,222	534,712	516,182

Appendix A

Participants in the BI International Investment and Trade Study

Amax
American Brands
American Cyanamid
American Hoist & Derrick
American Standard
AMF
Armco
Avon Products

Beatrice Foods

Cameron Iron Works
Corning Glass Works

Deere
Diebold
Donaldson

Eastman Kodak

Ford Motor
Freeport-McMoran

Garrett
General Electric
General Foods
Gerber Products
Gillette
Grumman International

Honeywell

Ingersoll-Rand
International Multifoods

Johnson & Johnson

Koppers

Levi Strauss
Loctite

Manville
Mine Safety Appliances
3M
Monsanto
Motorola

Occidental Petroleum
Olin

J.C. Penney

Pfizer International
Preformed Line Products

Ralston Purina
R.J. Reynolds Industries
Rexnord
Rockwell International

Santa Fe International
Schering-Plough
Sperry
A.E. Staley Mfg
Standard Oil of California
Stauffer Chemical
Sunstrand

Textron
TRW

Union Carbide
Union Special

Warner-Lambert
Westinghouse

Business International Corporation
One Dag Hammarskjold Plaza
New York, N.Y. 10017
(212) 750-6300

International Investment and Trade Study
Annual Report for 1982

For further information:

William Persen, *Senior Vice-President*
Project Director
Erika Izakson, *Vice-President, Research*
Project Coordinator

Your response to this questionnaire is confidential. Results will only be tabulated in aggregates, not by individual company. To ensure clarity and to facilitate possible follow-up, however, could you kindly indicate in the space provided below who in your company should be contacted in the event that it is necessary for us to do so.

Where questions cannot be answered with exactitude, please use estimates, placing an "E" next to the number. Only omit responses where no decent estimate can be made. Where information is not available, put an NA in the box. Where the answer is zero, enter a zero. Precede negative numbers with a minus sign.

In order to secure consistency, please recast data backward to make data consistent with 1982 figures to achieve maximum comparability. Where events of an unusual nature occurred, affecting year-to-year comparability, please attach a sheet explaining in brief what happened.

Here are some other general points to keep in mind:

- Puerto Rico and US possessions are considered part of the US.
- Where it would be difficult to obtain calendar year data, use your fiscal year data for the nearest year.
- If you have any thoughts that you feel should be communicated, please do so on the attached sheets.

		1980	1981	1982
1.	What were your company's consolidated sales or total operating income (in either case, please delete extraordinary gains and losses) (in $ millions)?			
1a.	What percentage was outside the US (including exports, except to Puerto Rico and US possessions)?			
2.	What were your company's exports from the US to your foreign affiliates (excluding Puerto Rico and US possessions) in which you own 20% or more (use 25% or more if more readily available) (in $ millions)?			
2a.	What percentage of these exports was used by affiliates as raw materials and components, or was otherwise further processed by them?			
2b.	What percentage of these exports was resold by affiliates to customers without further processing?			
3.	What were your company's exports from the US direct to unrelated customers excluding Puerto Rico and US possessions (in $ millions)?			
4.	What were your company's imports from affiliates (in $ millions)?			
4a.	What percentage of the figure noted in response to Question 4 represents:			
	i. Raw materials?			
	ii. Semimanufactures for further processing?			
	iii. Goods sold without further processing?			
	iv. Capital equipment?			
4b.	What were your company's imports from others (in $ millions)?			
4c.	What percentage of the figure noted in response to Question 4b represents:			
	i. Raw materials?			
	ii. Semimanufactures for further processing?			
	iii. Goods sold without further processing?			
	iv. Capital equipment?			

	1980	1981	1982
4d. What was the total dollar value of your foreign affiliates' exports to customers in the US other than the parent company (in $ millions)?			
5. What was your company's year-end worldwide consolidated gross investment (total assets less current liabilities) (in $ millions)?			
5a. What percentage was outside the US?			
6. What was your company's annual increase in net new *fixed* assets inside the US (in $ millions)?			
7. What was your company's annual increase in net new *fixed* assets outside the US (in $ millions)?			
8. Of the annual increase in gross investment (total assets less current liabilities) outside the US, how much was financed by US sources, i.e. how much was measurable as US balance-of-payments outflow, including funds borrowed by the US parent company abroad but not those borrowed by any foreign affiliate (in $ millions)?			
8a. How much of the outflow (defined in Question 8) was borrowed abroad by the US parent company (in $ millions)?			
9. Of the total investment in net new *fixed* assets outside the US, how much was used to purchase US-made machinery equipment, and similar products (in $ millions)?			
10. How much did the parent company record in dividends, branch earnings, interest, royalties and fees after foreign income and withholding taxes (in $ millions)?			

11. How many employees did your company have on these four dates—	Dec. 31, 1979	Dec. 31, 1980	Dec. 31, 1981	Dec. 31, 1982
a. In the US?				
b. Outside the US?				
Of those outside the US, how many were				
c. Local nationals?				
d. US nationals?				

12. . How many of the employees in the US reported for Dec. 31, 1982, if any, came from companies acquired in the US in the periods below, or how many were lost as a result of divestiture in the US (please net out US acquisitions and divestitures and show figures with a plus or minus sign)

Dec. 31, 1979-Dec. 31, 1980?

Dec. 31, 1980-Dec. 31 1981?

Dec. 31, 1981-Dec. 31 1982?

13. What was your net worth in your company's foreign affiliates as of.

a. Dec. 31, 1979? $ million

b. Dec. 31, 1982? $ million

FOR FURTHER CONTACT

Name Title

Company

Address

Telephone